Gas Journal

LIGHT - HEAT - POWER - BY-PRODUCTS

Vol. 246. 97th Year. LONDON, NOVEMBER 14, 1945. No. 4304. Price 1/-

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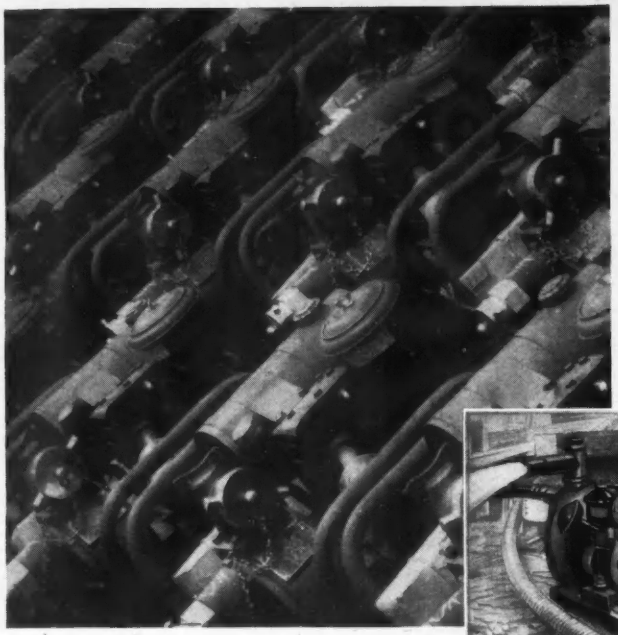

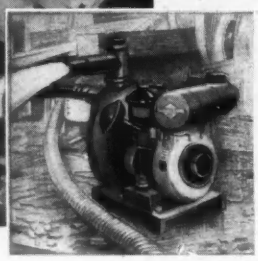

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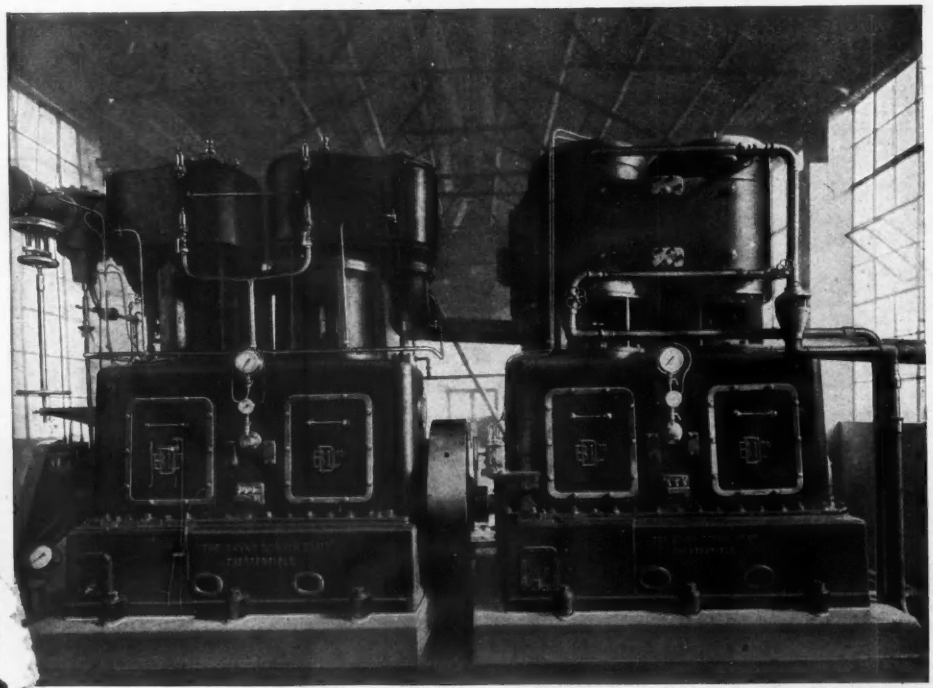

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GAS JOURNAL, NOV. 14, 1945
VOL. 246 97th YEAR No. 4304

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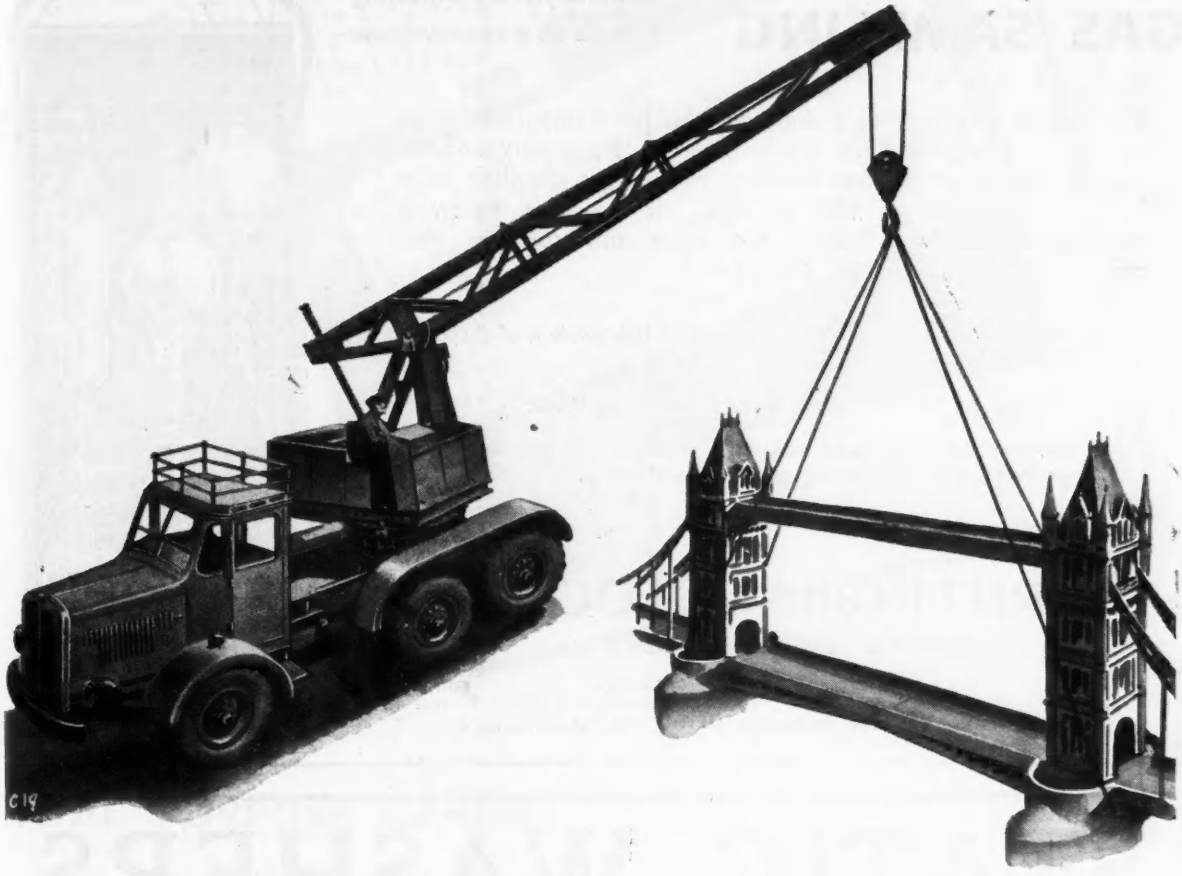

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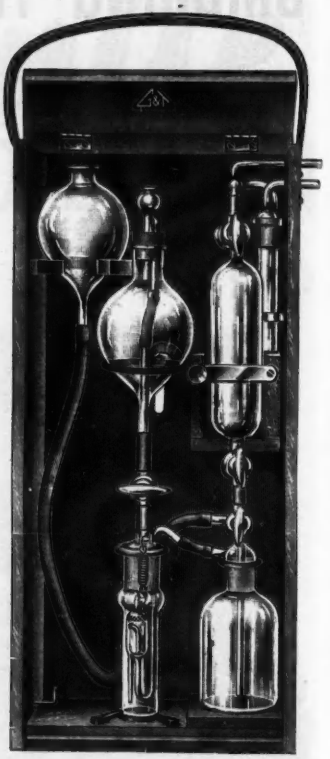

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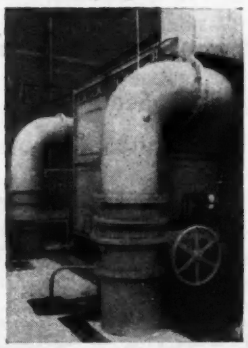

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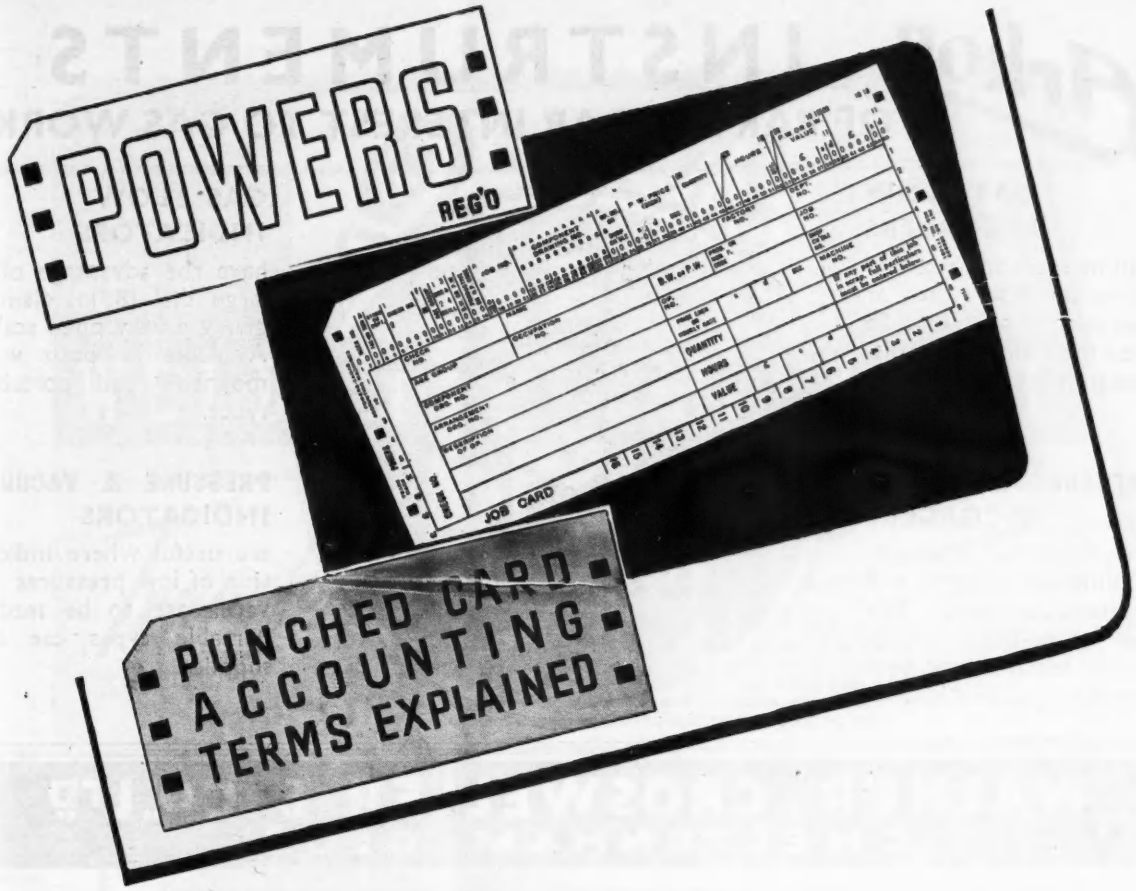

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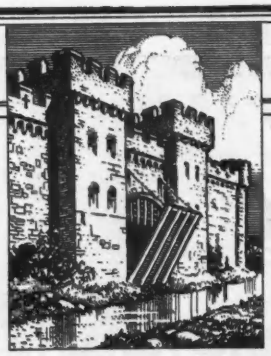

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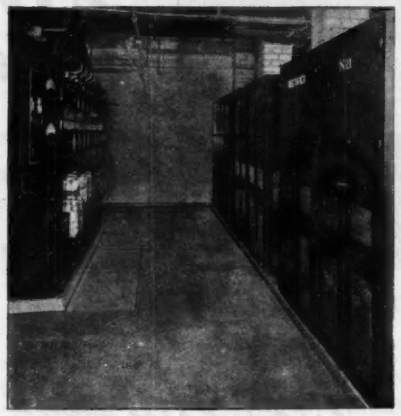

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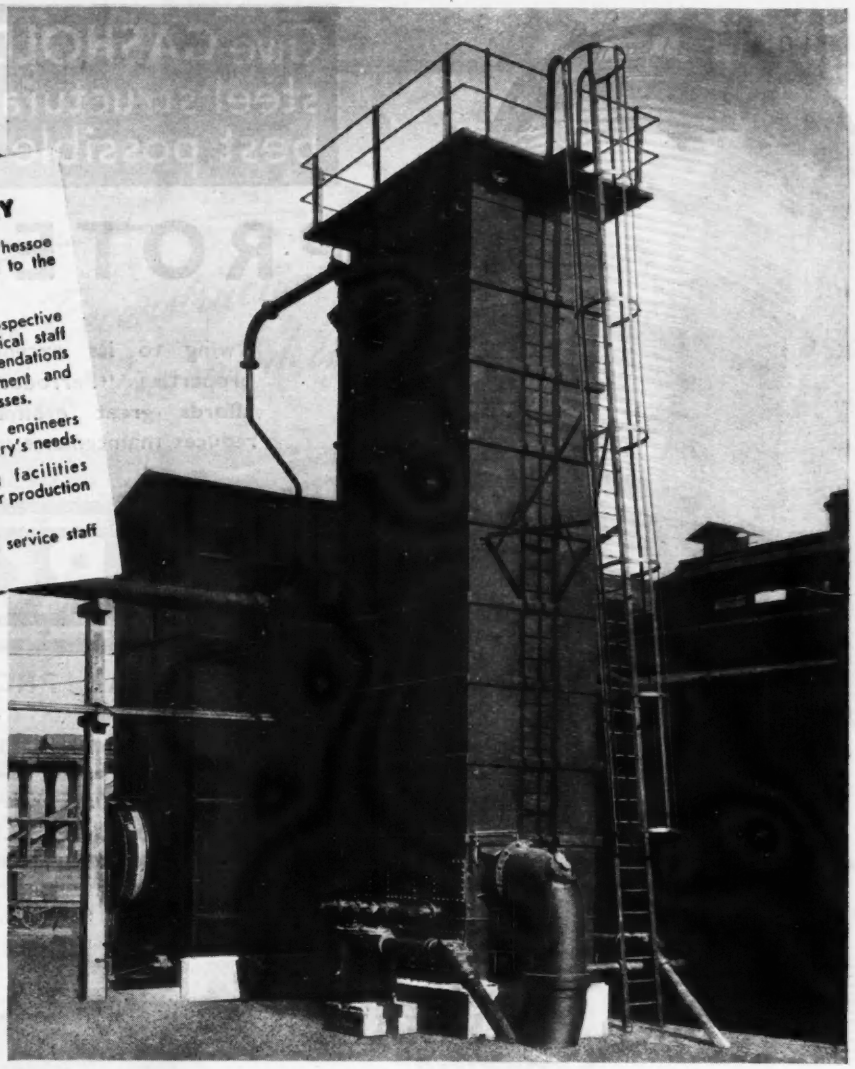

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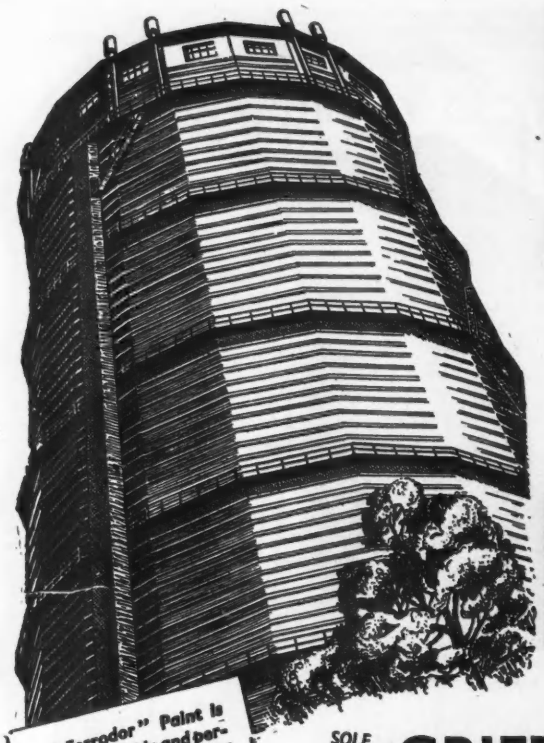

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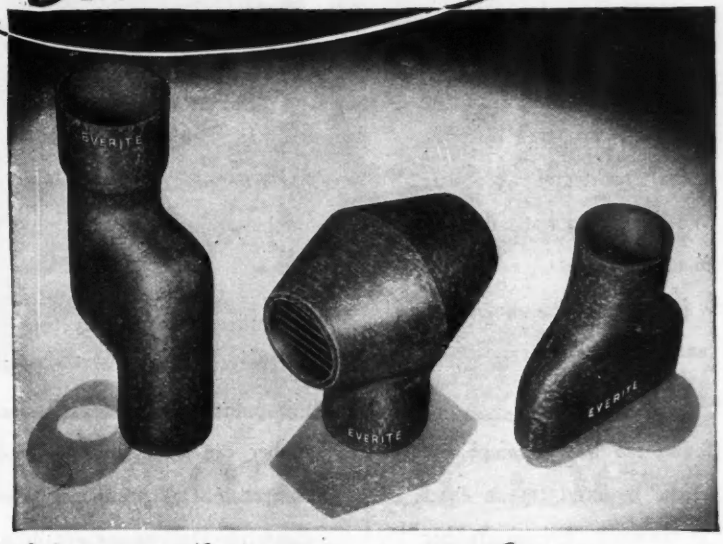

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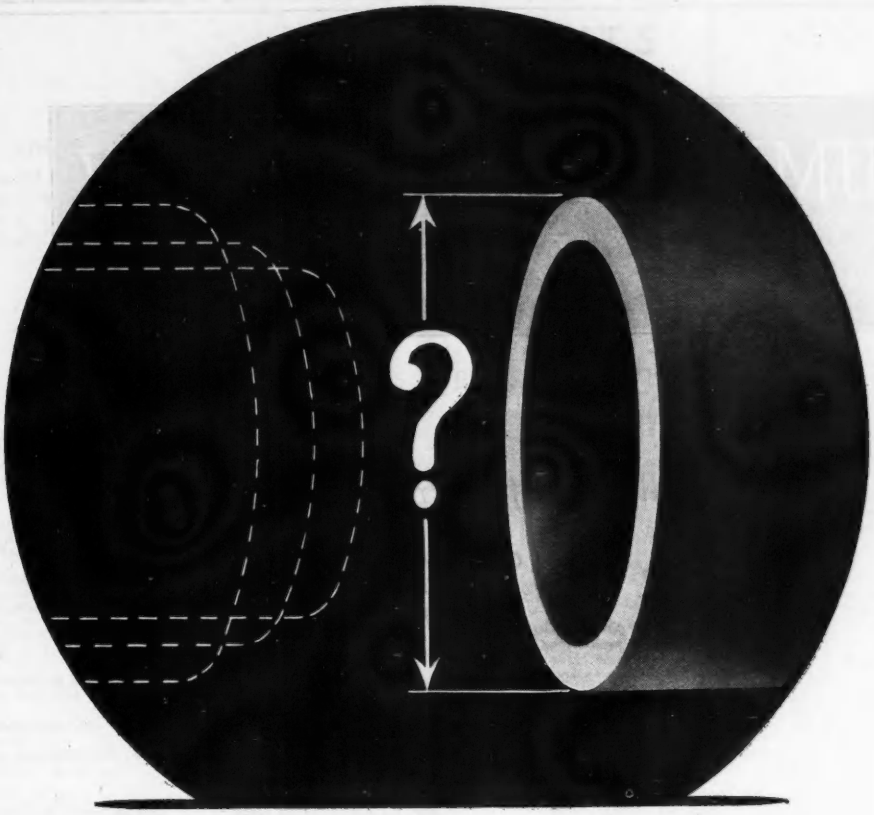

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CONTENTS

EDITORIAL NOTES

Mr. Shinwell's Choice . . . 673
The Public Utility Umbrella . . 673
Enterprise 673
"West's Gas" 674

Personal 674
Diary 674

Obituary 675
Letters to the Editor 675
London Juniors 676
Pudsey Centenary 676
Record Outputs at Dundee . . 676
From Experiment to Achievement . 677
Town Gas in the Glass Industry . 678
Coke Dust Briquetting . . . 678
Gas and Post-War Housing . . 679
The Stability of Heated Structures . 680

Scientists in Peacetime . . . 681
Smith Meters' War Service . . 681
This Question of Integration . . 682
Benzole Recovery by Active Carbon. By G. W. Robson . . . 687

Gas Products Prices 690
Gas Stocks and Shares . . . 690

THIS WEEK'S ADVERTISERS

	PAGE
Aeraspray Manufacturing Co., Ltd.	695
Alder & Mackay, Ltd.	696
Ascot Gas Water Heaters, Ltd.	Cover I
Aspinalls (Paints), Ltd.	S6
Bagnall, W. G., Ltd.	696
Bale & Church, Ltd.	693
Blakeley, Firth, Sons & Co., Ltd. ...	693
Bratt Colbran, Ltd.	S1
Carter-Erectors, Ltd.	658
Cementation Co., Ltd.	657
Concrete Proofing Co., Ltd. ...	658
Crane, Ltd....	690
Crookston, S., & Co., Ltd. ...	692
Curtis, A. L.	692
Dempster, Robert, & Sons, Ltd. ...	693
Donkin Co., Ltd. (The Bryan)	Cover II
Electric Construction Co., Ltd. ...	664
Empire Rubber Co.	668
Engineering Specialists, Ltd. (Vee-Reg Valves)	S6
Gas Meter Co., Ltd.	S3
Gas Purification & Chemical Co., Ltd.	693
Glover, George, & Co., Ltd. ...	657
Glover, Thos., & Co., Ltd. ...	672
Goodall, Clayton & Co., Ltd.	Cover IV
Green & Boulding, Ltd.	693
Griffin & Tatlock, Ltd.	660
Griffiths Bros. & Co. (London), Ltd.	666
Hamilton, Archd. H., & Co., Ltd.	664
Harrisons (London), Ltd.... ...	693
Horseley Bridge & Thomas Piggott, Ltd.	S5
Humphreys & Glasgow, Ltd. ...	670
Jeavons, E. E., & Co., Ltd. ...	692
Keay, E. C. & J., Ltd.	S8
Keith Blackman, Ltd.	S8
King's Patent Agency, Ltd. ...	693
Kirkham, Hulett & Chandler, Ltd.	660
Laidlaw, R., & Son (Edin.), Ltd,	666
Main, R. & A., Ltd.	686
Meltham Silica Firebrick Co., Ltd.	662
Mewburn, Ellis & Co.	693
New Bowson Coal Co.	692
North British Rubber Co., Ltd.	Cover III
Parkinson, W., & Co.	672
Pegson, Ltd.	Cover II
Powers-Samas Accounting Machines, Ltd.	661
Pulsometer Engineering Co., Ltd.	Cover IV
Quasi-Arc Co., Ltd.	663
Quickset Water Sealers, Ltd. ...	695
Radiation, Ltd.	684, 685
Reavell & Co., Ltd.	692
Siebe, Gorman & Co., Ltd. ...	S6
Sisson, W., & Co., Ltd.	S2
Slingsby, Walter, & Co., Ltd. ...	691
Sperryn & Co.	671
Stanton Ironworks, Ltd.	694
Staveley Coal & Iron Co., Ltd. ...	664
Steels Engineering Products, Ltd.	659
Stein, John G., & Co., Ltd. ...	691
Stewarts and Lloyds, Ltd. ...	669
Stoves, Ltd....	S3
Technological Institute of Great Britain	693
Thomas & Bishop, Ltd.	690
Trotter, Haines & Corbett, Ltd.	693
Turbine Furnace Co., Ltd. ...	S6
Turners Asbestos Cement Co., Ltd.	667
Underpressure Engineering Co., Ltd.	692
Vale, Thomas, & Son, Ltd. ...	S6
Wakelin, F. H., Ltd.	693
Walker, C. & W., Ltd.	S2
Walker, Crosweller & Co., Ltd....	662
West's Gas Improvement Co., Ltd.	688
West's Piling & Construction Co., Ltd.	Cover IV
Westwood & Wrights, Ltd. ...	692
Whessoe, Ltd.	665
Winn & Coales, Ltd.	S4
Wood, Hugh, & Co., Ltd. ...	S7
Woodall-Duckham Co.	683
Trade Cards	690
Appointments Vacant and Wanted	693, 694
Books	693
Educational	693
Patents	693
Plant, &c.	693
Plant, &c., For Sale and Wanted ...	693
Repair Work	693

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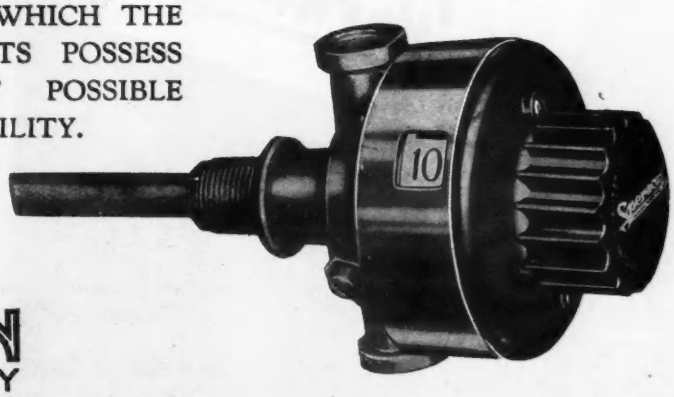

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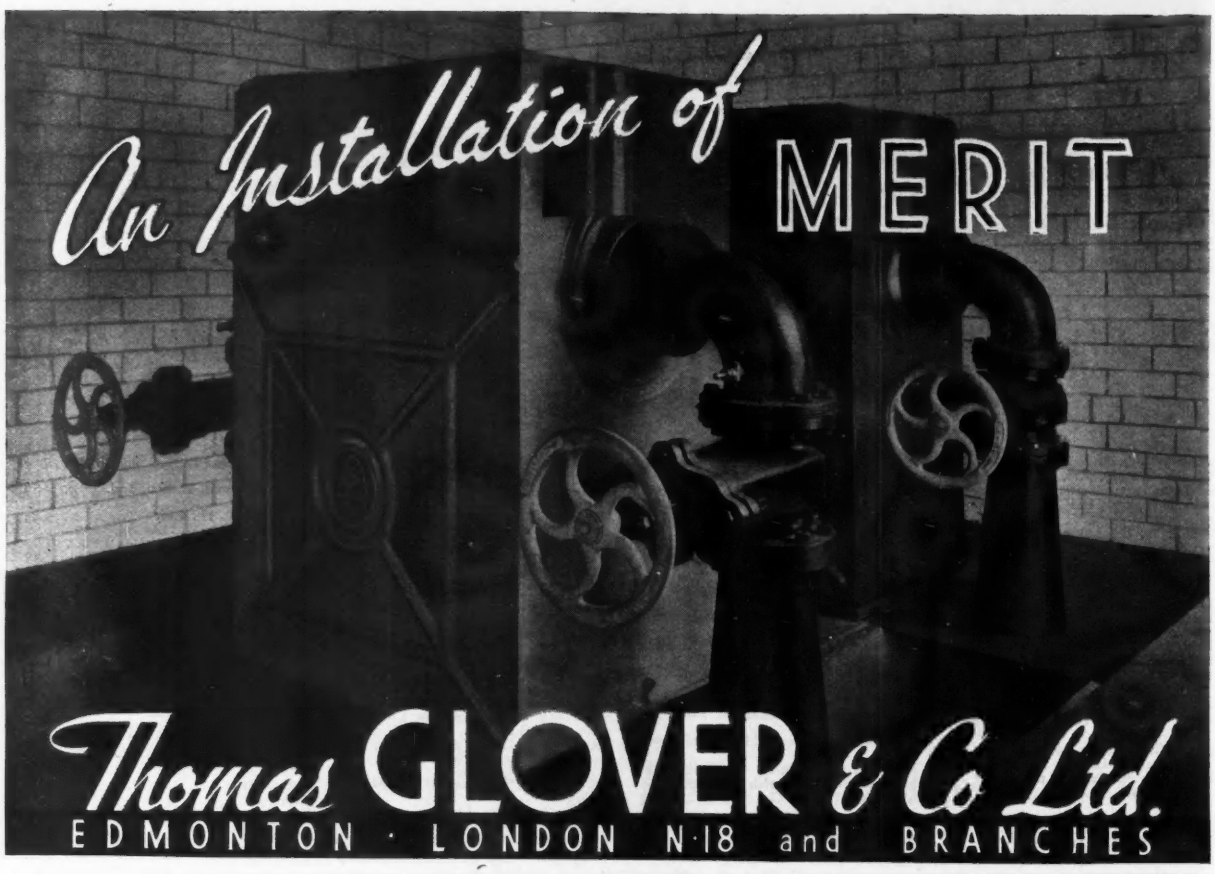
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Parkinson

GAS JOURNAL, NOV. 14, 1945

VOL. 246 97th YEAR No. 4304

It is with deep regret that we announce the death, which took place on November 8, of W. Rupert King, Editor of the "GAS JOURNAL," in his 55th year.

MR. SHINWELL'S CHOICE

THE time is fast approaching when decisions must be taken upon the future organization of some or all the sections of the carbonizing industries. The Heyworth Report is understood to be completed, though at the time of writing it has not been issued. What is in that report we do not know and we shall not venture to guess. The iron and steel industry is modernizing its equipment, a task that obviously could not be undertaken during the war, and that now requires doing, not because the equipment was out of date before the war, but because lessons have been learned and plant has become worn out. In the course of that modernization some £6,500,000 is to be spent on new coke ovens, a figure which suggests that for the future the iron and steel industry will possess its own coke ovens and will not rely upon the collieries to provide metallurgical coke. Coke ovens situated at the collieries are bound to be affected by the nationalization of the collieries, though in what way we do not yet know.

Coke ovens situated at the steelworks may be considered as being in a category apart. They are ancillary to the steelmaking plant. They should, and often do, provide that plant with coke and gas and have little or none of either available for sale outside. What is to be done with the rest of the carbonizing industry? That is Mr. Shinwell's problem, and in its solution he will require all the help he can obtain. His own attitude can be sensed from his Address to the Institute of Fuel as reported by us in our issue of Oct. 24. It is well to remind ourselves that the Minister of Fuel and Power declared that the power given to the Government at the election "must be used with the greatest reason and discretion. It must not be applied in a doctrinaire fashion. It is necessary," he went on, "to create in the new organization that will soon be invoked the best and highest form of administration . . . It has never been the intention to entrust the administration of this or any industry to the Civil Service." Again, a little earlier, Mr. Shinwell, having referred to the fuel industries as the foundation of our industrial prosperity, and having pointed to the vast fund of knowledge we had at our disposal, "gained from the patient and intensified efforts of technologists and scientists in many fields," maintained that the difficulty lies in the application of that knowledge. "That," he said, "is where the partnership of the technologist, scientist and politician is important, and it is a poor politician and a poor Government that does not recognize the importance of this partnership." Our reading of this speech is that when the reorganization of the fuel industries is taken in hand, it will be upon the basis of strictly technical considerations. These industries will not be nationalized for the sake of nationalization, but only if purely technical reasons suggest that they will thereby be made more efficient and better able to perform their functions as the foundation and basis of our future industrial prosperity.

§§

THE PUBLIC UTILITY UMBRELLA

A PRIMARY decision regarding the carbonizing industries that Mr. Shinwell will be called upon to make will be the future of the colliery-owned coke ovens. He may be faced with a demand from the miners for these plants to be included as part of a nationalized coal industry. There has long been a delusion on the part of the miners that profits of a very high order are made at the coke ovens. To provide every possible financial advantage for a nationalized coal industry, the cry may well ascend for incorporation of the coke ovens with the mining industry. That is not a sound technical proposition; it is ideological. It has its seat in just those doctrinaire theories which Mr. Shinwell has abjured. From the severely technical aspect, the logical place for the colliery-owned coke ovens is within the Gas Industry. That does not mean that we propose that the coke ovens should be taken away from the present owners and handed over to the Gas Industry. These coke ovens supply coke and gas to the same markets as the Gas Industry. They produce in other respects exactly the same products as the Gas Industry, and these are all sold through the same channels. Both serve the public. It happens that the Gas Industry has the status of a public utility, whereas the coke ovens have not, but there is no reason why the public utility umbrella should not be opened a little wider to admit the coke ovens as producing units—not, of course, as selling units, since that is already provided for. A proposal has been made for a Central Carbonization Board to embrace the Gas Industry and colliery-owned coke ovens. It is a suggestion meriting thought.

The Government, through its *Housing Manual*, has expressed in no uncertain manner its favourable view of smoke abolition. The mistaken notion has got abroad, particularly in certain Ministries—to judge from Mr. Key's recent address to the National Smoke Abatement Society—that the carbonizing industries cannot provide the necessary smokeless fuel. The incorporation of the colliery-owned coke ovens in the Gas Industry, and the co-ordination of both through a carbonizing board, might well assist in the provision of the necessary smokeless fuels. To make Britain smokeless would be an achievement for any Minister of Fuel and Power that would carry his name down to history as a reformer

ENTERPRISE

AN opportunity is now before Mr. Shinwell. There is a verse in the *Rubá'iyát* which reads:

> " . . . Could thou and I with Fate conspire
> To grasp this sorry scheme of things entire,
> Would we not shatter it to bits—and then
> Re-mould it nearer to the heart's desire?"

The present Minister of Fuel has been given the power to grasp the present scheme of things, to shatter it to bits, and to re-mould

it—but how? Not, we suggest, to the heart's desire of anyone, but upon a technological model. Now is the time for everyone of good will to help to attain a technological model which will work. We do not doubt that the Minister will be glad to receive any helpful suggestions based upon sound premises.

One problem at least will arise under nationalization. On a technological basis the low thermal efficiency of electricity generation should restrict its use for heating. Maybe this will be interpreted as a thought having competition as its background. Yet, without competition, will not the spur to enterprise be blunted? Nationalized industries will no doubt run on under their own impetus for a term, but there may come a time when fewer and fewer of those engaged in them are spurred on to take risks, to take the trouble to invent, to keep their industry in the van of progress. That, however, is another story. It is not wholly technological, nor is it wholly psychological. In reorganizing an industry it is not *only* the technical considerations that must be borne in mind. Whatever is done must contain the spur to enterprise. It does not matter whether it is public enterprise or private enterprise, so long as there is enterprise. One of the greatest problems in reorganization on national lines is how to maintain enterprise.

"West's Gas"

It was with peculiar pleasure that we received the October issue (No. 1 of Vol. 18) of *West's Gas;* not because of any particular feature in its contents, but because it marked the resumption, after an interval of six years, of a link that we always cherished. The defence ban on news and pictures of gas-works plant, coupled with staff depletions and paper shortage, necessitated the suspension of publication from October, 1939, onwards. Now at last the veil has been lifted, and although we have already had the pleasure of reviewing briefly the wartime activities of West's Gas Improvement Co., Ltd., the first post-war issue of *West's Gas* gives us a more intimate glimpse of life and personalities at Albion Ironworks. Home Defence, Passive Air Defence, and Home Guard operations are described in detail, and illustrations of tanks, mine sinkers, and buoys reflect the contribution made to the war effort over and above the construction and maintenance of vital carbonizing plants. Since the last issue of *West's Gas* 13 gold watches have been presented on completion of 40 years' service and, 46 long service certificates have been awarded for 25 years' service. Henceforward *West's Gas* will continue to record those activities of the Company that are of general interest to the Gas Industry. For a time, at any rate, owing to the paper position, shortage of labour, and heavy pressure on the staff, it can be published only at two-monthly intervals.

Personal

After 41 years' service in the Gas Industry, Mr. WALTER GROGONO, Engineer and General Manager of the Croydon Gas Company, will retire at the end of the year. Mr. Grogono joined the Company in 1927, and since then he has seen the annual gas sales increase by 540 million cu.ft., and the number of consumers rise by over 34,000. He started in the Industry as pupil at West Ham, and in 1910 he joined the engineering staff of the Gas Light and Coke Company. Before his appointment at Croydon he was Senior Assistant Engineer at Fulham. He was appointed Engineer and General Manager in 1939, on the retirement of Mr. W. J. Sandeman. The post of General Manager has been filled by the appointment of Mr. D. V. O'MEARA, Deputy Town Clerk of Croydon. Mr. O'Meara went to Croydon eight years ago, and was formerly Deputy Town Clerk of Birmingham. After a brilliant scholastic career at Clifton College, where he was classical scholar, and at Oxford, Mr. O'Meara qualified as a solicitor in 1926.

* * *

After a long absence from duty through illness, and on the advice of his doctor, Mr. J. H. CADMAN, Commercial Manager and Secretary of the Manchester Gas Department, has tendered his resignation, which will take effect from the end of the year. Mr. Cadman entered the service of the Department just over 43 years ago as a junior from the Nicholls Hospital School, where he was educated. He was appointed Assistant Commercial Manager and Secretary in 1928, and attained his present position on the death of Mr. J. H. Sillitoe in 1937. He was one of the representatives of the North-Western District on the Central Executive Board of the National Gas Council, and represented the Manchester undertaking on the Executive Committee of the British Commercial Gas Association, and continued that representation on the fusion of the two bodies. He also acted as spokesman on coal supplies for the North-Western District.

Mr. J. BROOK, Great Yarmouth, has taken over his duties as Manager of the Westhoughton Gas Company in succession to Mr. R. V. HART, who left the Company for South Wales some months ago. A native of Batley, Yorkshire, Mr. Brook served in the Windermere Gas Department prior to his appointment with the Great Yarmouth Gas Company three and a half years ago.

* * *

Mr. A. E. SIMPSON, Deputy Engineer and Manager of the Spenborough Gas Department, has been appointed Engineer and Manager of the Newark Gas Department in succession to Mr. W. H. BLUNDSTONE, who, as already reported, has been appointed Engineer and Manager at Malvern. Mr. Simpson was formerly with the Nottingham and Macclesfield undertakings.

* * *

A family association with the Louth Gaslight Company extending over a period of 120 years has been severed by the retirement of the Secretary, Mr. P. ALLISON. In 1825 Mr. Allison's grandfather, Mr. W. G. Allison, was appointed Secretary on the formation of the Company, and he held the office until 1851, when his son, Mr. T. F. Allison, was appointed in his stead. Upon his resignation in 1903 he was succeeded by Mr. P. Allison, who has held office for 42 years and now retires at the age of 84. Mr. D. L. BIRCHMORE, Engineer and Manager, takes over the duties of Secretary in addition to his other responsibilities, and an Assistant Engineer and Manager is to be appointed.

* * *

Mr. WILFRID BROWN, of Buckhaven, has been appointed Assistant Gas Engineer and Manager at Falkirk.

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Mr. E. QUINTON has retired on the completion of 50 years' service with the Nottingham Gas Department. He was Manager of the original showrooms in Wheeler Gate and George Street, and more recently the modern premises in Parliament Street.

* * *

The following have joined the Board of Directors of George Wilson Gas Meters, Ltd.: Mr. F. C. Wilson, brother of the late Managing Director; Mr. G. E. Withers, A.C.A., who joined the firm as Accountant in 1937, and was recently appointed as Secretary to the Company; and Mr. W. A. Dobson, who joined the firm in 1936, having previously been Assistant Engineer and Manager of the Ilkley Gas Company from 1923, an appointment taken up from the Stockton-on-Tees Gas Company, where he served his early years.

* * *

Mr. L. WILKES has been appointed Midland Area Sales Manager of Cannon Iron Foundries, Ltd.

Diary

Nov. 17.—Manchester Juniors: Visit to Higginshaw Gas-Works, Oldham, and to the works of J. Stott & Co., Ltd. Presidential Address by F. Cartledge.

Nov. 20.—Southern Association of Gas Engineers and Managers (Eastern District): Meeting, Gas Industry House, 2.30 p.m. Discussion on Institution of Gas Engineers' Paper, "Technical Aspects of the Gas Industry's Contribution to Post-War Housing."

Nov. 21.—Institute of Fuel: Institution of Mechanical Engineers, Storey's Gate, 6 p.m. Paper on "Heat Transmission" by Dr. M. Fishenden, and Dr. O. Saunders.

Nov. 23.—London Juniors: Gas Industry House, 7 p.m. Address by Dr. C. C. Paterson.

Nov. 23.—London Juniors: Address by Dr. C. C. Paterson, O.B.E., F.R.S., Gas Industry House, 7 p.m.

Nov. 27-28.—Institution of Gas Engineers: Autumn Research Meeting.

Nov. 27.—Midland Juniors: Visit to the works of the Bryan Donkin Company, Ltd., Chesterfield.

Dec. 6.—Town and Country Planning Association: Lunch-time meeting, 28, King Street, Covent Garden, W.C. 2. Talk and discussion on "Heating the Family Home."

Dec. 7.—North of England Gas Managers' Association (Auxiliary Section), Newcastle, 2.15 p.m.: Address by J. M. A. Mitchell, Newcastle and Gateshead Gas Company.

We Have Received from Messrs. McGowan, Perry, & Partners, 34, Birkdale Road, London, W.5, a booklet on "Common Sense Costs," one of a series published by them as "a contribution to the re-invigoration of British business." It outlines a method of costing which they claim is free from the disadvantages of the older type of costs, but offering prompt results, control over every phase of the business in time for that control to be effective, and offering these things at a much lower clerical cost than any other type of costing system. Gas manufacture is among a large number of industries listed as having derived benefit from this method of costing.

Obituary

Walter Rupert King

The death of my brother, at the early age of 54, leaves an ache in many hearts and an empty place in many circles. He was essentially a family man, and our first thoughts are for his widow, son and daughter, who will find some consolation in knowing that their love for him was matched by the affection and esteem in which so many others held him. For the family in general he was a wise head and a prudent counsellor. In the firm he has been a worthy successor to a line of great editors, whose work and policy were activated by a high sense of duty. In and out of business, his genuine qualities, his readiness to help anyone, his real sense of humour (somewhat veiled, maybe, for the uninitiated) brought him an ever-widening circle of friends. They will, I think, agree that Rupert had to a very marked extent the power to grasp essentials, marshal facts, and put them cogently before his audience or readers. No one, I am confident, will deny that he could write English as beautifully phrased and polished as any in this "cine-headline" era. I have often regretted that this talent had not full scope in the highly technical columns of our Journal.

My brother has died when his interests were probably wider than ever before, and when there was surely a prospect, distant perhaps, of emerging from the restriction and frustrations of the war. From 1928 to 1941, and during the war so far as it was possible, we worked in closest co-operation in every phase of our business. In my memory of that association there is no shadow of displeasure or regret.

Rupert King, elder son of the late Walter King, and grandson of W. Broughton King, who from these offices in 1849 published the first *Journal of Gas Lighting*, went from Dulwich Preparatory School to Rugby in 1905. He left in 1910, after a brilliant school career which he finished as Head of the Modern Side and Head of his House (Tudor). In rugger he got a cap, which might have been a "XV" if he had not played half-back at a time when the school was full of first-class players. In cricket he earned his "XI" just after his 17th birthday in 1908, and remained to captain the side in 1910. He was a natural wicket-keeper, and I understand that the School pro (then Cuttle, of Lancashire) said he could have walked into any county team. I personally do not remember his missing any chance or standing back to any bowling, but only a few months ago he told me that just before the last war when playing for Blackheath—so perhaps Geoffrey Gill can corroborate the story—he was standing back to a fast bowler with W. G. Grace batting. The Old Man snicked one right into his hands and he put it on the floor. Rupert later came to the conclusion that he must have been talked out of his catch while the ball was in the air. My brother was a member of the M.C.C. and several clubs, and after settling in the South played regularly for Esher until 1937.

On leaving school he went to France for 9 months and then to Hanover, where for a year he worked in the offices of the I.C.G.A. Gas Undertaking, of which Mr. E. J. Hutchence was then Engineer. Returning home, Rupert started work in the downstairs office at Bolt Court. Then came war, and in the first days of August, 1914, he joined the queue at H.Q. of the H.A.C. He went out with the 1st Battalion, spent the first grim winter in the mud, and as a lance-sergeant came back in June, 1915, to take a commission in the Durham L.I. Subsequently he saw considerable service in Salonika, and finished the war on the Intelligence Staff in Constantinople. He was mentioned in despatches. Returning home he married, in February, 1919, Esme, third daughter of Colonel (now Sir Frank) Simpson, of Wylam-on-Tyne.

Later that year he joined the staff of the Stella Coal Company; but in 1928, on the death of A. F. Bezant, Editor of the "JOURNAL," I strongly pressed Rupert to return to Bolt Court and the work for which he had always been intended. He consented, and at first made his special care the development of the *Salesman* and the *Pocket Book*. When Alfred Harrison retired in 1936, Rupert was his natural successor as Editor. Of the result I have written sufficient in the early lines of this memoir.

C. A. K.

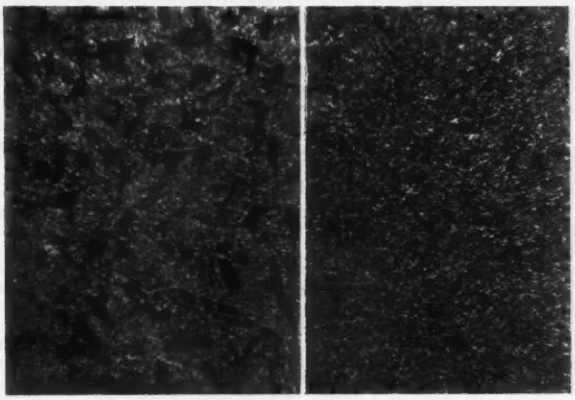
Again the strain of the war years has taken its toll. In the death of Rupert King the Gas Industry has lost yet another of whom it can ill afford to be deprived—and he was so young in years and spirit. It has been the writer's high privilege, throughout this difficult period and for several years preceding it, to be closely associated in daily work with Rupert King, and he is filled with sadness at the loss of a beloved chief. Never one to suffer fools gladly, Rupert King abounded in sympathy and kindness. His every thought, his every action, commanded respect—and more than respect, for his nature was a lovely, gracious one. To work for him and with him was verily an education. Calm amid troubles, with an exquisite sense of values, Rupert King remains to the writer, who owes so much to him, inspirational.

N. S. S.

Letters to the Editor

Stability of Heated Structures

DEAR SIR,—Since I wrote my Paper on the "Stability of Heated Structures" (see "JOURNAL" of Oct. 31 and Nov. 7) I have been fortunate in finding some buckstaves in a very interesting condition. They have a permanent set of about 6 in. The opportunity seemed too fortunate to miss. Accordingly I had a section cut from the most distorted part, about 5 ft. above stage level. The section was polished and microphotographed on the hot and cold flanges. On examination of the prints—see accompanying photograph—I think you will all agree that there had been a profound change in the structure of the metal. The temperature of the hot flange on the concave side was only about 160°C. in service.



What this all means I would not like to say, because we have examined only one part of one buckstave, but it has strengthened my opinion that there may be a fruitful field for investigation here.

South Metropolitan Gas Company, Yours faithfully,
709, *Old Kent Road, S.E.* 15. LESLIE MUIR WILSON.
Nov. 5, 1945.

Commercial Prospects of Spent Oxide

DEAR SIR,—During the war period some gas undertakings, at any rate, have found purification from H_2S to produce a trifle on the revenue side instead of being a liability. This has naturally followed from the heavy freight charges on imported sulphur and pyrites, which are the alternative raw materials for sulphuric acid making. Nevertheless the increased production of spent oxide (due to increased gas production and the higher sulphur content of the coal used) has only been placed with difficulty, acid makers showing some reluctance to change their raw material. This reluctance was not unnatural when it is remembered that in most cases a change would have meant building new burners—no easy undertaking in wartime. Yet, seeing that new oxide burners have not in fact been built in any number, the Gas Industry would do well to consider the post-war position.

On a superficial view the prospect for the only large home produced source of sulphur would seem excellent, as American sulphur, its most serious competitor, cannot be bought without dollars. There is, however, another consideration. Consumers of sulphuric acid show a consistent tendency to ask for a purer article, especially as regards iron content.

If the comprehensive statistics recently published with the authority of the Ministry of Supply and giving the trade uses of acid over the period 1940–5 are consulted, it will be seen that the production of acid for the first half of 1945 from spent oxide plus pyrites was about 350,000 tons. This is acid which, made from a raw material of which 40–50% is ferric oxide, cannot be low in iron. Of the uses of which it can be said that the iron content is a matter of indifference, superphosphate accounted for 195,000 tons, and two or three smaller uses may bring this total up to say 225,000 tons. The difference, 125,000, evidently went to uses for which a low iron acid would be preferred if it was available.

This tonnage is about the quantity used for sulphate of ammonia making, and no doubt the great bulk of the by-product sulphate of ammonia made to-day is in fact made from spent oxide acid. Yet it is quite certain that a high iron content causes difficulties in producing sulphate of ammonia with a desirable crystal size, and this business cannot be considered safe for spent oxide acid. For the remaining market outlets, covering some further 250,000 tons, high iron acid is at a greater disadvantage, and is for many uses most strongly objected to. Some of these uses—*e.g.*, rayon and transparent paper—have been restricted during the war and may now be expected to increase, at the expense of others, for which oxide acid is quite suitable.

A further point which must be faced is that railway rates which have not been greatly increased during the war can scarcely be expected to remain at their present level, and any increase will bear much more

hardly on a material containing 45–50% sulphur only than on 99% American sulphur.

It would seem therefore that while spent oxide should be at no disadvantage as against imported pyrites, its only hope as against sulphur is in the national financial stringency, which we all trust will not last indefinitely. This being so, larger gas undertakings would do well to consider any process which will separate the sulphur content of their coal, or the bulk of it, as sulphur, and not in a form in which it carries 50% of useless and deleterious ferric oxide, moisture, and so on.

Such processes have been in the development stage for a considerable time without finding any very extended use for various well-known reasons. But they should not be ignored. The only other alternative, if the conventional oxide purifiers are to be retained, would be to operate an extraction process at the gas-works. The known solvents suitable for such processes are not precisely attractive to the gas manager anxious to keep a minor department of his works on a trouble-free basis. There are, however, the strongest economic reasons why the Gas Industry should endeavour to become a seller of sulphur rather than of spent oxide, and the question deserves careful study as a matter of urgency.

West Cumberland By-Products Co., Ltd.,
Flimby, near Maryport.
Nov. 6, 1945.

Yours faithfully,
C. IRWIN,
Managing Director.

London Juniors

A Meeting of the London and Southern District Junior Gas Association was held on Nov. 2, when over 80 members attended Gas Industry House, S.W. 1, to hear a Paper on "Some Industrial Applications of the Non-Aerated Gas Flame," read by Mr. J. F. Waight, B.Sc., of the Industrial Technical Office of the South Metropolitan Gas Company.

The Author discussed the technical merits of non-aerated burners and their application to certain special items of gas-fired industrial equipment, including air heaters, water heaters, soft metal melting furnaces, and a high temperature regenerative furnace. Special reference was made to a simple high capacity burner and its control system and the method of designing such a burner. The Paper was illustrated with numerous lantern-slides. The keen interest shown by the members in this Paper was indicated in the brisk discussion which followed.

Before the presentation of the Paper, the President, Mr. L. W. Andrew, extended a cordial greeting to Brigadier Lloyd, a member of the Association, on his return from the Forces, and members were reminded of the forthcoming meeting on Friday, Nov. 23, when Dr. C. C. Paterson, Director of Research, of the General Electric Research Laboratory, will give an Address entitled "Some Thoughts on Industrial Research." The Address will be illustrated by lantern-slides, and Dr. H. Hollings, Controller of Research of the Gas Light and Coke Company, has accepted an invitation to open the discussion. Members of the Illuminating Engineering Society have been invited to be present at this meeting, which will be held at Gas Industry House.

Pudsey Centenary

Pudsey Gas Company, which, as briefly reported in the "JOURNAL" of Oct. 31, has just celebrated its centenary, sold 343,450,600 cu.ft. of gas last year, compared with 1,900,000 cu.ft. in 1845, when the first Manager received a salary of £60 a year, with house and fire, and the first employee had a wage of 21s. per week.

The history of the Company, as told in a souvenir booklet prepared for the centenary celebrations, is a remarkable record of enterprise. In its first 92 years the annual sales rose to 151 million cu.ft. In 1937 the United Kingdom Gas Corporation acquired a controlling interest in the undertaking, and then followed the development of the West Yorkshire Gas Distribution Company's grid and the formation last year of the West Riding Group of Gas Companies, of which group the Pudsey Company is an integral part.

While sales between 1937 and 1944, thanks largely to the operation of the grid, increased by 127%, the capital employed by the Pudsey Company increased by only 27%. The declared price of gas to-day at Pudsey is lower than that at Leeds or Bradford, in the case of the latter very considerably lower. In 1936 the Company received 44.9d. for each 1,000 cu.ft. of gas sold, and in 1944 it received 40.13d.; in other words the average price received for gas was 4d. per 1,000 cu.ft. lower than in 1936. The Pudsey works are being maintained in good order as a standby plant, and may have to be operated during the coming winter, as they were last winter.

In responding to the toast of the Company at the centenary dinner, Col. W. Moncrieff Carr, Managing Director of the United Kingdom Gas Corporation, and Chairman of the Pudsey Company, said they did not know what the future held. The U.K. Gas Corporation had done a great deal to improve and cheapen the service in the area it served. They were told the Government was going to introduce a scheme of nationalization. He could only hope, although he found it difficult to believe, that by nationalization the service could be further improved and cheapened. Unfortunately it was going to be very difficult to test that. In a time of rising prices comparisons were very quickly lost. If nationalization did not give a cheaper and better service of gas to the consumer, then there was no justification at all for it.

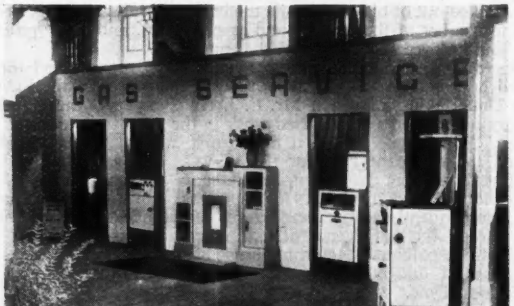
Record Outputs at Dundee

Many records which have marked the history of the Dundee Gas Department were surpassed during the war. Mr. James Dickson, Engineer and Manager, states in his report for the year ended May 15 that the output of gas rose steadily (with a slight check in 1943) from 1,965,271,100 cu.ft. in 1939 to 2,023,254,300 cu.ft. in the year under review, while gas unaccounted for fell from 10.44% to 3.94%. The manufacturing and distribution plant was at the outset of the war equipped to a degree which enabled demand to be met quite easily in the early stages. Evacuation of many families reduced the demand on supplies, while public and stair lighting, which had previously amounted to 8.66% of the total output, was entirely suspended. The advent of many new factories and the adoption of gas for various industrial processes in existing factories and workshops created heavily increased demands from 1942–43 onwards, with the result that the undertaking in 1944–45, for the first time in its history, exceeded a yearly output of 2,000 million cu.ft. After an interval of nearly six years public and stair lighting are again being brought into operation. The total consumption under this head in 1939 amounted to approximately 150 million cu.ft., so that future requirements can now be visualized by taking the latter load into account, while preparing to meet the expanding need for provision of services for temporary and permanent houses and an industrial demand which it is hoped will be maintained at least around the present level.

Extensions already in hand and others due to be completed in time for next winter's peak demand are estimated to raise the total rated carbonizing capacity to 11,193,000 cu.ft. per day, against 7,621,000 cu.ft. per day in 1939. This will leave a more ample proportion of retorts available for lying off for repairs and major reconstructions. On the average these operations may absorb up to 15% of plant, leaving the net productive power from coal gas plant at 9,514,000 cu.ft., against 6,478,000 cu.ft., equivalent to approximately 47% more carbonizing capacity than in 1939.

The mutual aid scheme for gas undertakings was well organized and functioned well, although no extreme demand had to be made upon its resources. Dundee fortunately escaped the dislocation of services experienced by many undertakings further south, but on the few occasions of air raid damage the staff and workmen carried out their duties in such a manner as to create the clear impression that if the occasion had required more, this also would have been forthcoming.

The price of gas was increased in the first year of the war by 8d. per 1,000 cu.ft., but after one quarter it was reduced by 4d. to the basic price of 3s. 6d. per 1,000 cu.ft. It remained at that figure until last January, when it was raised to 3s. 8.625d. At the same time the declared calorific value was reduced from 450 to 425 B.Th.U., and thus the price increase was equivalent to 12½% on the thermal rate. A further increase of 0.75d. per therm has since been sanctioned.



Gas Service again provided the "high spot" at the Town Planning Exhibition of the Henley Borough Council last week. The illustration shows part of the comprehensive Gas Exhibit of the Yorktown (Camberley) and District Undertaking, which included the latest New World Cookers and Fires in practical settings.

United Kingdom Gas Corporation, Ltd., has declared an interim dividend of 2½% (actual), less income tax, for the year ending Dec. 31, 1945, payable on Nov. 20.

The Northampton Polytechnic Institute (St. John Street, Clerkenwell, London, E.C. 1) is initiating a Course in Illuminating Engineering, specially adapted to meet the needs of those desiring to take the examination of the City and Guilds of London Institute. The Course is to commence in the first week of December next. Students will attend for three evenings a week, and enrolments (at a very moderate fee) can take place up to Nov. 30. Those interested should get in touch with Mr. H. S. Barlow (Tel. CLE 1662), who will be responsible for the course and will be pleased to give further information.

From Experiment to Achievement

IN 1942 the Coventry Housing Committee felt grave concern with regard to the shortage of living accommodation in the City, and the problems which would have to be faced in the provision of houses in the post-war period, to replace those damaged by enemy action, to continue the slum clearance programme and to make up the leeway of the war years. The Committee foresaw a great shortage of skilled building labour and a possible shortage of materials, and recognized the necessity for utilizing the industrial resources which would become available, and for building with unconventional methods if the task were to be accomplished.

The Housing Committee therefore instructed the City Architect, Mr. D. E. E. Gibson, to prepare designs for two houses of experimental construction with a view to making a thorough research into new methods and materials and to effecting improvements in the planning of the working man's home. At the same time Radiation Ltd. expressed a wish to interest themselves in two houses demonstrating the desirability and suitability of the use of gas and coke for domestic cooking, space heating, hot water supply, washing, and clothes drying. Accordingly, an agreement was concluded whereby Radiation Ltd. would sponsor two experimental houses, putting into practical form the results of the research work which had been carried out in connexion with space heating and hot-water services for the post-war home.

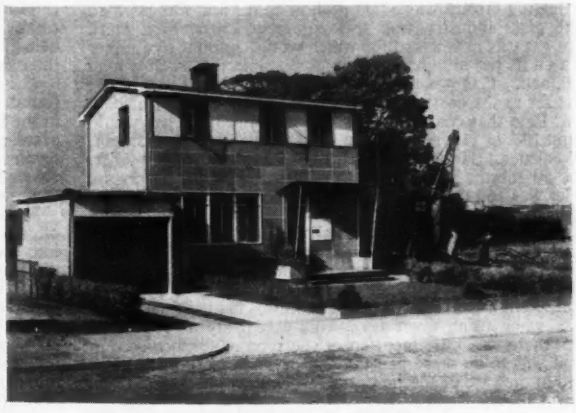
This house therefore illustrates the happy fusion of public demand, industrial technique, and professional skill.

The House—Its Plan and Construction

It was felt that in the past insufficient attention had been paid to the amenities of the home, whilst perhaps too much thought had been devoted to the reduction of cost, and keeping down floor areas to a minimum, to the detriment of the house. In the preparation of the plan, great attention has been paid to the needs of the people and the way in which they live, and an endeavour has been made to reduce housework, fuel consumption and the maintenance of the building and its fitments. The large living room with dining recess, the narrow shape of the kitchen, the square hall, the introduction of a utility room, the size and shape of the three bedrooms, are all features incorporated after the most careful and deliberate thought.

The planning centres on the prefabricated plumbing duct, in which all the services, flues and waste pipes are located for easy access, economy, and freedom from frost effects. This internal planning of flues and pipes ensures the conservation of heat within the house.

In considering the construction each material was chosen for its particular properties. In this respect the external walls are built up in three distinct sections: (1) A steel frame to act as the load-bearing member; (2) an external cladding to act as a watershed; and (3) an internal lining to take care of insulation and decoration. The framework (details of which were designed by Tubewrights Limited) consists of light tubular steel members welded into units, with uprights at 3-ft. centres, and beams and roof trusses having a clear span of 21 ft., leaving the interior of the house to be planned quite freely and independently.



On the left we see the prefabricated plumbing duct in position. All pipes, flues, vents, and so on, are incorporated. Below is a view of one of a pair of houses. The delivery hatch is clearly discernible.

It was by close collaboration with the City Architect and his Department that the requirements asked for by the Radiation Research and Technical Departments—namely, centralization of the essential services incorporating short insulated hot water pipe runs and insulation of the house structure—were developed to a point which enabled these desirable principles to be incorporated in dwellings large or small.

The heating and hot water services thus made available, using a combination of gas and coke, give the high standard of comfort at the low cost of running which, on the evidence of the Ministry of Labour Report (*Ministry of Labour Gazette*, December, 1940) is necessary to bring to full realization the improvement in domestic comfort envisaged in the vast undertaking of re-housing Britain.

In 1942, with the encouragement of the Housing Committee, the Architectural Department set to work to produce a house which would embody: (1) Construction which is both designed and produced in a scientific manner. (2) The use of the right materials in the right place. (3) Carefully chosen finishes. (4) The incorporation of such labour-saving devices as were considered economically possible.

Three years have been spent in research into materials and methods, in the testing of various forms of construction and in the erection of "mock-ups" on which experiments could be made and from which valuable data could be deduced. As we have already recorded in the "JOURNAL," at one of the associated works of Radiation Ltd. an experimental kitchen and bathroom unit was constructed, complete with all fittings, and cooking and space heating apparatus, by means of which the designers of the fittings were enabled to test and adjust them to suit the particular requirements of this type of house, and the Architectural Department was permitted to record and make use of the reactions and observations of the numerous visitors to the kitchen. Throughout the whole development of this project a very close co-operation has been maintained with, and much valuable help obtained from, the Research and Technical Service Department of Radiation Ltd., at Birmingham.

The internal lining of the house consists of 3 ft. wide wooden-framed units filled with an insulating material and faced with ⅜ in. plasterboard. These units are wedged into position between channels at the floor and ceiling. In the living room and dining recess they are thinly veneered with oak, while those in the kitchen and bathroom are covered with blue or cream washable leathercloth. The thermal insulation value of this form of wall construction is higher than that of 22½ in. of brickwork.

The two houses of a pair will be structurally separate and complete, the only connexion being the facing slabs effecting the joint. The intervening air space will assist in the prevention of noise transmission. The plumbing duct, previously described in the "JOURNAL," is prefabricated in two sections and incorporates all the services and pipes in the house.

The space and hot water heating of the house are effected by a Radiation slow-combustion stove with back boiler situated in the living room. The boiler provides heat for a calorifier hot water tank, and for three concealed type radiators in the kitchen, hall, and two bedrooms, as well as for the bathroom towel rail. A Radiation gas cooker and a 1½ cu.ft. Electrolux gas refrigerator are installed in the kitchen. The clothes-washing facilities are provided in the utility room with a built-in unit consisting of gas wash boiler, wringer, and large sink. Next to this is a gas-heated drying cupboard. For summer use, when the slow-combustion stove is not required a gas circulator heats the water for sinks, lavatory basin, and bath. Each bedroom contains a "Silent Beam" gas fire.

Town Gas in the Glass Industry

The following is a report of the discussion on the Paper by Mr. R. J. Bradshaw to the Manchester District Association of Gas Engineers (see "JOURNAL" of Nov. 7).

The **President** (Mr. C. H. Bamber) said the Association was indebted to the St. Helens Gas Undertaking, and also to the St. Helens glass industry, for the information they were able to supply concerning glass production processes. The load was a unique one for the Gas Industry, and it was gratifying to find that gas, as a refined fuel, was ideally suitable for the purpose. He would like to know what proportion of the manufacturing cost of, say, ordinary window glass was represented by the fuel used.

Mr. **Bradshaw** replied that one ton of glass required about 52 therms of gas to produce it. It was very difficult to arrive at an exact figure, because each form of glass had to receive different treatment. The thicker the glass, or the more it was worked upon, the greater the consumption of gas, particularly in the cooling.

Mr. **Dickinson** (West Yorkshire Gas Distribution Co.) said he was in charge of industrial matters relating to the use of gas in the West Riding of Yorkshire—namely, the West Riding Group of Gas Companies. There were a number of important glass factories in the West Riding, chiefly manufacturing bottles and pressed ware, but including some very high-class crystal glass. For all auxiliary purposes the firms used purified town gas. Quite a number of experiments had been carried out in regard to glass melting, and the position generally had now reached a stage at which a lot of gas was desirable which could not be possibly supplied at the moment. He was originally trained at Sheffield as a glass technologist, and was therefore somewhat fortunate in understanding what the glass manufacturer wanted from his point of view, and what could be offered him from the point of view of the Gas Industry. At present the output of the West Riding Group was 5,000 million cu.ft., and the gas load taken by the glass industry was approximately 250 million cu.ft. A quantity of gas was now asked for which would amount to another 9,000 million cu.ft. per annum, and it was possible that such a load could be obtained. Gas was undoubtedly the best fuel to use for the purpose. As far as the cost of fuel was concerned, he would place it at the present time that coal gas compared with producer gas would be round about 10d. or 11d. per 1,000 cu.ft., taking labour into account, but not convenience. He disagreed with the statement made by Mr. Bradshaw of 50 therms per ton of glass. In the South Yorkshire Area the order was 160 therms, or more.

Glass works used town gas for feeders, both for dropping into moulds and for rotary feeders. The small feeders took round about 350 cu.ft. an hour, and the large 10 ft. rotary worked from 6,000 to 10,000 cu.ft. per hour.

Reference was made in the Paper to the advantages and disadvantages of the different materials, but no mention was made of the saving in man-power when using town gas. This was really a formidable item. Again, there was little mention of the type of furnace used in melting, but it was to be presumed that in the one case producer gas was used, and in the case of special optical work it would be town gas.

Mr. **Bradshaw** said that producer gas was used for melting, with the exception of optical glass, when there must be absolutely no foreign matter present in the melting process, otherwise the entire melt would be ruined. At St. Helens there was a considerable tonnage of pitch-creosote used for the manufacture of very crude glass.

Mr. **T. R. Cook** (Blackpool) though Mr. Dickinson had somewhat confused the members with regard to the price which could be charged by the Gas Industry. They were all aware that in the South Yorkshire Area, during the past 15 years, there had been large quantities of coke oven gas available, and it had been quite simple to introduce gas into the glass industry to compete against the cost of producer gas. No one would think for a moment of offering town gas for the melting of the batch material for the manufacture of ordinary glass, but for the lehrs and other process work it had been proved that town gas was the premier fuel. The way in which Mr. Greaves and his staff had handled their big load was most creditable. Although Mr. Greaves was short of plant he saw the load ahead of him, and was able to bridge the gap by reason of the aid he received from an adjoining undertaking.

Dr. **M. Barash** (Manchester) was surprised that Mr. Bradshaw had not made any reference to the removal of sulphur from coal gas. He understood that sulphur was one of the bugbears of the glass industry. St. Helens had been successful in the removal of organic sulphur from coal gas.

Mr. **Bradshaw** was glad that Dr. Barash had mentioned the point, because the St. Helens plant could really be regarded as the "baby" of all sulphur removal. It was put in by W. C. Holmes & Co., Ltd., and since it had been installed it had never given a day's trouble in working. Sulphur removal was essential when a finished glass was required with a clean finish without after-treatment. Sulphur did not spoil the glass if there was "bloom" present as it could be washed off. Nevertheless, it was desirable to remove the sulphur rather than add another process of glass washing.

Mr. **H. Curtis** (Macclesfield) proposed a vote of thanks to Mr. Bradshaw, and Mr. J. H. Clegg (Marsden) seconded.

Coke Dust Briquetting

By invitation of Mr. T. W. T. Hammerton (Manager and Secretary) the October meeting of the Yorkshire Commercial Section of the Manchester District Association of Gas Engineers was held at the Showrooms of the East Hull Gas Company, when the opportunity was taken of paying a visit to the Company's works to inspect the "Tapping" coke dust briquetting plant. The working of the plant was explained to the visitors by Mr. Tapping (inventor of the plant), Mr. Hammerton, Mr. B. Stonham (Engineer), and members of the Company's staff.

The initial plant, laid down under contract in 1943 on an experimental basis, to ascertain not only the practicability of briquetting coke dust, but also the utility of coke dust briquettes as fuel for different uses, comprised simply an under-driven mortar mill, elevator, fluxer, cooling pan, and roll-press. With the initial plan, it was only possible to work by batch process, two tons throughput comprising a fair day's work for one man working a whole shift. During the present year the plant has been refitted to give a continuous throughput of one ton per hour, this throughput being regarded as the optimum to occupy one workman fully throughout the week in disposing of the Company's average production of 25 tons of minus $\frac{3}{8}$ in. coke dust.

An elevator, rotary screen, feed hopper, and feeding bank have been interposed between the mortar mill and the original elevator, charging the fluxer; a cooling conveyor to remove the briquettes from the press, and a small bunker suitably arranged to charge a Lister truck have been added on the discharge side of the plant.

Greater difficulty than at first anticipated had been encountered throughout the operation of the initial plant through the failure of the open-type D.C. motors which had been installed for expediency owing to the impossibility of securing totally-enclosed motors in the time desired. During the conversion of the plant for continuous running, the open-frame and protected motors were all replaced with totally-enclosed ball-bearing Laurence Scott motors, the majority being fitted with built-in gearing with output shaft speeds suitable for the reduction gears to which they were coupled.

The coke dust being virtually dry, very much greater objection was found to the emission of airborne dust than would be encountered in the case of coal dust handled through the same system. So far as is practicable in the refitting of an existing plant without complete reconstruction, this difficulty has been removed. Chutes have been covered in and the new rotary screen and the feed hopper totally enclosed.

Briquetting mixture, already prepared in the proportions of 9 parts of coke dust approximately to 1 part of broken pitch, is fed manually into the mortar mill, which discharges continuously into the boot of the first elevator. The minus of $\frac{3}{16}$ in. mixture passing through the screen enters the charging hopper, while the oversize gravitates back to the mortar mill for re-treatment. Rate of feed into the briquetting system proper is regulated by adjusting the height of the gate and hence the depth of material passing over the feed bank, so that with the rolls fully charged with briquetting mixture the fluxer remains approximately full. The speed of the cooling conveyor is such that a single layer of briquettes receives the maximum time to cool before discharge into the bunker.

The press rolls, of composite construction, constitute the outstanding departure in this plant from normal briquetting plant design. These rolls, which are fully patented, comprise cast-iron hubs to which are secured peripheral rings of interchangeable half-mould plates, each segment constituting a row of three half-moulds. This form of roll has been developed out of lengthy research undertaken as the outcome of the commercial failure of large-scale lignite coke briquetting operations abroad.

As the plant has not yet been run continuously for any considerable period no opinion can be given on wear and tear. The product, to which the name "Cokoids" has been given, sells freely at the same price as coke at present. What the market will be when fuel is in good supply cannot be foretold. The Local Fuel Overseer has scheduled the product at 65s. per ton at works, the price for coke being 56s. 1d. per ton at works.

At the instance of a number of coke producers whose small individual accumulations of coke dust would not justify the installation of a stationary plant, though their cumulative output would provide continuous work for a briquetting plant of moderate size, a fully mobile plant, mounted on a 10-ton low-loading trailer, has been designed, and is now in course of erection by an engineering contractor.

A Meeting of the Scottish Junior Gas Association (Western District) was held on Oct. 13 at the Royal Technical College, Glasgow, when Mr. McFadyen, Dumbarton, gave his Presidential Address. Mr. Dickson, Airdrie, the retiring President, welcomed the members, and intimated with regret the loss sustained by the deaths of Mr. T. Carmichael, Portsmouth, an Hon. Member, and Mr. Gillan, Glasgow. Mr. McFadyen was installed in office by Mr. Dickson, who paid tribute to the work done by the Council and Mr. McFadyen. In conclusion Mr. Bell, a founder member, moved the vote of thanks.

Gas and Post-War Housing

Mr. L. W. Andrew, one of the Authors of the I.G.E. Paper, "Technical Aspects of the Gas Industry's Contribution to Post-war Housing," attended a general meeting of the Midland Association of Gas Engineers and Managers in Birmingham on Oct. 25 to lead a discussion on the subject. The President of the Association (Mr. A. B. Britton) was in the chair.

Mr. ANDREW expressed appreciation of the invitation to be present, and pointed out in reference to the Paper that while the suggested method of approach to the problems was probably of general application, the detailed recommendations were based on practical tests carried out by the Gas Light and Coke Company. He believed that the recommendations given were to a large extent applicable to Southern England, but he hoped in the discussion the special requirements of the Midlands would be dealt with.

The PRESIDENT said he knew that if they could get every house to use 200 therms of gas in a year it would be of great advantage to the Industry, but he thought that the man in the street did not generally realize that it was just as essential to set apart an amount, in his budget, for heating as for rent and rates.

Mr. ANDREW agreed, but thought that people did not realize that by the correct choice of equipment they could obtain the higher standard without any increase in their budget. It was shown at Kensal House that for what was spent now people could get a better service by having the right appliances and using them in the right way.

Mr. F. C. BRIGGS (Dudley) said that most of them were managers responsible primarily for their undertakings, and in the last five or six years the whole of their time had been spent in keeping coal in the yard and gas in the pipes. On top of that they had been swimming their way through an avalanche of forms and there had also been a spate of suggestions for planning reforms which it had been impossible for them to summarize to their own advantage. Therefore, they were very much indebted to the Authors for bringing together all the salient points of the various reports and putting them in front of them. He thought that Domestic Centres attached to the Domestic Development Committees had to come, and he hoped that they would come shortly. One of the main points which emerged from the Paper was that the industry was a Two-Fuel Industry. In the past they had too often talked about gas and paid scant attention to coke. The formation of Coke Associations, in which that district had taken a leading part, had helped to dissipate that feeling and to get people to appreciate coke, but it had to be properly graded and marketed.

Background Heating

A point which emerged from the Paper was one on which many of them would want to cross swords with the Authors—that was background heating. The value of background heating was incontrovertible. If the whole house was heated to 50°F. then it was easy to get the rooms warm, and if only the hall was heated to 50°F. one could get warm in a room without scorching one's nose and having one's back frozen. But it could not be done without some form of background heating. Whether that was to be carried out with flueless gas heaters was the point at issue. He was opposed to flueless background heaters in living rooms particularly. He pointed out that the main reason that lighting had been very largely lost was because it had to be maintained; that had to be done every six weeks or two months, and if there was one thing a woman did not like, it was for the gasfitter to be constantly in the house. A gas cooker would go for a year without maintenance, but he doubted if a flueless heater would do so. Personally he would advocate the use of hot water radiators run from the coke heater.

He commended the reference in the Paper to insulation which would effect a saving in all fuel, and if it could be achieved would take them a long way.

On the question of capital cost and running costs he said the Government had done them a service in respect of their recommendations upon the installation of fittings, because the house which was just a box of bricks, and into which the tenant had to put every fitting, had been a problem. Speculative builders and local authorities had done everything to cut capital cost in the past without regard to running costs, but if that was reversed it was going to be an advantage.

Mr. Briggs spoke of the value of a two-part tariff system and suggested that in this direction they would have to be more courageous. He also wanted to cross swords on the question of the amount of water which it was suggested would be used. He did not think that people would be satisfied with the number of baths which were allocated. If the hot water was available much more would be used, and he thought that that was one of the weaknesses of the calculations given in the Paper. He doubted if a house fitted in the way proposed would be found, in the 12 months, to confine itself to the amount of hot water calculated. Unfortunately there was a general tendency for people to be careless, and not to exercise that care which enabled a particular facility to be used at an economic figure.

Appendix 4 he described as ingenious. He appreciated the reason, but the method must be viewed with intelligence. In the case of 565 therms of gas used the actual coal needed was in fact 7½ tons. Coke amounting to 3¾ tons was available for use elsewhere. But there must exist a satisfactory market for this coke. It was an example of the fact that finance did enter into the picture. They had to sell the coke, and if all houses could afford to go on all gas, then the whole balance of their revenue might be upset.

Hot Water Usage

Mr. ANDREW agreed as to the necessity for the Industry to satisfy the working man, but urged that they must go beyond that. They should have a real pride in the Industry, and aim at giving a really magnificent service to the public. They should not sell gas because it was cheap, but because it was the finest source for providing hot water, and so on. He would suggest the hot water load as the pivot of the Paper, and not background heating.

He described himself and his colleagues as entirely unrepentant in respect of background heating. The controversy had gone on for a long time, and in the case of the Gas Light and Coke Company they got to a stage where they felt that some independent authority must settle the question. He referred to the findings of the Royal College of Physicians on the subject, which he thought should reassure them as to flueless heating, although, of course, there were certain qualifications. Reference was made to the tables and conditions laid down in that report.

"I should like to emphasize," said Mr. Andrew, "that the use of flueless heaters as suggested is not to provide the total heat for a house, but only the partial heat, either supplementary in cold weather, or alternative in mild weather. We can find no technical evidence that in doing that we are doing anything to lower the prestige of gas."

The use of hot water radiators was a good way out, but they only wanted background heating for 7 to 14 weeks in a year, and so it should be subsidiary to the hot water. There was also less wall discoloration with a background heater than with a radiator.

On the subject of hot water usage, he pointed out that in London before the war nothing like 220 gall. were used, but that was probably because the facilities were not there. They were a little frightened that the 220 gall. standard was a little higher than people would use until they were educated up to it, but they had put in the Paper 350 gall., which allowed 10 baths and a good service at the sink and wash basin. He thought that it was unlikely any working class family would exceed 350 gall. His personal view was that it was unlikely that the 220 gall. would be exceeded.

Mr. W. L. SPINKS (Birmingham) said it was recognized that the standards set out in the Paper had to be revised for the Midlands and the North. Accepting the statements put forward in the Paper, they had to see what problems they had in the area and endeavour to supply a total heating service to houses upon the two-fuel basis. They had to see what difficulties they were likely to meet if they endeavoured to put that into force. He thought they could meet differences in income by altering the ratio of the gas and coke used.

Mention had been made of insulation, and he thought that was one of the things that might be preached to the housewife rather than as they had done in the past, that housework was all drudgery, and that the sooner the woman got out of the kitchen the better. There were wider things they could preach—and not that the home was merely a place of drudgery. He asked if they would be really able to push this hot water service if 60% of their consumers had to pay at a penny a time. He enquired as to the efficiency of drying cabinets and what was actual experience with them, adding that he did not think women in Birmingham would pay ninepence a week for drying their clothes.

Mr. ANDREW considered it a foolish thing to put over that women must not work in the home, and he agreed with Mr. Spinks that this sort of publicity had been overdone. What they wanted to do was to show how drudgery was eased by the use of gas instead of solid fuel fires, and that the apparatus which eliminated so much drudgery was that which embodied proper hot water facilities in association with gas for cooking. In this connexion Mr. Andrew touched on the advantage of penny in the slot meters which had a sixpenny or shilling attachment, and enquired what the practice was in the Midlands.

Mr. SPINKS said the tendency was to go on to the two-coin meter, but two-coin meters gave them more trouble than a straight 1s. slot meter.

Mr. ANDREW, turning to Watson House and its work, said that it was not an academic establishment, and he trusted that the Paper did something to dispel that idea. They felt that it was their job at Watson House to keep in touch with people in the district. Through these contacts they were enabled to enquire into criticisms and eliminate complaints. On the question of the availability of new appliances, he could only say that production has reached a stage when the goods would be shortly available. But they had experienced, as everybody had, many disappointments, and it was all a matter of the supply of labour. What should be borne in mind was that what the Industry supplied now was what they would to a very great extent be judged by in the near future.

Drying cabinets had become important, and the Ministry had awakened to the fact that they had a function to serve. At Watson House quite a lot of tests had been made on these cabinets, some comparative results of which Mr. Andrew gave. From pre-war

experience they found with a few thousand drying cabinets in use that very few complaints were made, and every one came to Watson House for investigation. In each case it was traceable to the kitchen. Without doing any scientific tests, supposing the kitchen ventilation was bad, their feeling was that if there was introduced into the kitchen a flue ventilating shaft of at least 30 sq. in. they would get rid of the condensation problem.

Mr. J. MITCHELL (Leicester) gave his experience of hot water provision with special reference to gas circulators and coke-fired boilers. He said the electrical immersion heater was an appliance which the Gas Industry was up against. With the limit in the provinces of £1,200 as the cost of houses, he did not see how they were going to include all these modern appliances. He described his method of introducing a coke fired boiler to ensure an ample supply of hot water, which the housewife wanted on tap as required. For this purpose they needed to insist on graded fuel.

Mr. ANDREW said he agreed as to the competition to be met from immersion heaters, and suggested there would be an advantage in the division of the tank into upper and lower receptacles, so that the small tank could give five or six gallons of water and the whole could come into operation when a bath was required. With regard to flueing, he suggested that this was not an expensive item if it was carried out at the plan stage of the house and not afterwards.

Mr. C. F. W. RENDLE proposed a vote of thanks to Mr. Andrew and Mr. W. G. S. CRANMER seconded.

The Stability of Heated Structures

The following discussion took place on the Paper by Mr. L. MUIR WILSON to the Southern Association of Gas Engineers and Managers (Eastern District). The Paper was published in the "JOURNAL" of Oct. 31 and Nov. 7.

The CHAIRMAN (Mr. G. L. Braidwood) stressed the Author's statement that buckstaves could not prevent expansion, and said he felt strongly on the subject of bunkers being supported on them. Mr. Wilson claimed that the primary object of buckstaves was to support the mouthpieces, but that did not apply in the case of verticals. He had said that a further function was to guide the expansion into the joints, and that he felt was a point of primary importance in the case of verticals. When settings were re-set they moved outwards to a considerable extent, whereas the old division walls moved very much less, and it occurred to him that the best compromise was, if they could control the pressure on the buckstaves, to use that method, and according to latest practice he thought that could be done by means of springs on vertical retorts. The practice of using wedges and washers was, on the other hand, very unsatisfactory. On the question of oval retorts, he would add that they were somewhat stronger structurally than the ⌂ shape.

Mr. F. M. BIRKS (Gas Light and Coke Company) said he was in agreement with practically everything Mr. Wilson had said in what he regarded as a very useful contribution to their knowledge of the subject. In dealing with carbonizing plant the expansion and contraction due to variation in daily load was quite different from the expansion and contraction arising from variation in the seasonal load. So far as one could see, the future of the Industry must allow for a considerable proportion of the plant, probably something of the order of 30%, to be of such a nature that it could with speed and at the least possible cost be put in and out of action at the different seasons. Starting with the foundations one might be led to suppose that the massive plants of considerable length in some of the larger undertakings were wrong for that purpose, because it was almost impossible to split the foundation into short lengths and still allow for the continuity of the carbonizing plant above. He therefore suggested that in starting with an effective foundation they should reduce the length of each of the masses of brickwork to something very much less than at present. His own view was that it should be something not much longer than the length of a setting.

Forms of construction had very materially altered in the last quarter of a century. They were tending to use much higher temperatures and so taking advantage of silica bricks and retorts, and at the same time making their foundations considerably lighter than was usual in the past. The reinforced concrete raft held on piles could be very vulnerable to temperature changes. On the question of buckstaves, Mr. Wilson had remarked that these should not be stronger than was reasonable. His own view was that it was always economical to increase the weight of the steelwork in any setting; there was never any waste in putting in plenty of steel. There could be no question that the one and only duty of the buckstave was to support the setting. Another point of particular interest was the attention which Mr. Wilson drew to the movement of the setting above the producers. It was news to him that that occurred in a horizontal setting, although he had no doubt it did, and he would take an early opportunity of seeing for himself. He congratulated the Author on the excellent work he had done, and suggested that the work should not stop where it was now. The more information they could have about it the better, because in his opinion it was one of the most important points in carbonizing plant.

Mr. MUIR WISON said he was in agreement with Mr. Birks on the question of buckstave strength. He did not mind how strong the buckstaves were made, but they must not fall into the error of trying to oppose an irresistible force by an immovable post. People who had tried to do so in the past had found it led to trouble. There was an opportunity for someone to carry out an investigation on the metallurgical behaviour of buckstaves during service, but it needed a specialized knowledge which was possessed by few of them in the Gas Industry.

Mr. R. T. DE GRUCHY (Gas Light and Coke Company) said they were fortunate at Beckton in that their retort houses could be worked continually for five years after resetting, thus avoiding deterioration from cooling and reheating, but even so he agreed that lengthy sections tended to be troublesome. Whether a section of 10 settings was the ideal he did not know, but he certainly thought present practice could be improved upon. With regard to the re-setting of retorts, all retorts above the bottom bed level had to be of silica, and the structure was regarded as monolithic. Expansion was accommodated by clearances of ⅜ in. on either side of the settings and 1½ in. at the top under the main arch. Those allowances were slightly below the theoretical expansion, but it had been thought wise to err on the tight side rather than to have loosely set retorts. Two tiers of retorts increased the distance from each other slightly on heating up, but that did not cause any inconvenience in practice. Mr. Wilson seemed to have been at some pains in his design of setting to allow expansion clearances between the tiers of retorts, and he would like to ask why he considered that to be necessary. He had apparently had some distortion due to the expansion of the main flue arch. In the Beckton type of setting there was a central main flue and the brickwork was practically solid, and they had not experienced any distortion of shape from that cause. He would like to hear what method of construction Mr. Wilson advocated for the front walls of settings. His impression was that the first length received more than its fair share of stress, and the remedy was for the front walls to be made of silica with enough insulation on the face to keep the temperature above 700–800°C. That would keep the expansion of the front wall in line with the rest of the cross walls.

Mr. MUIR WISLON said that he felt that they had to have expansion joints somewhere, otherwise there would be great increases in length and width, and he preferred to have expansion joints in the walls between the two tiers of retorts so as to make these tiers of retorts remain on their original centre lines. In regard to the front cross walls, they lined them with silica bonded with the outer course of hard insulating brick. When they used diatomaceous bricks the shrinkage was so great that more heat was lost by the influx of cold air than was prevented from escaping by the insulating properties of the bricks, because bricks of this nature shrank so much in practice. The temperature on the inner faces of their front and back walls where insulation is really good was now nearly as high as in the rest of the setting. This raised retort end temperatures and made it possible to put more coal in, but these higher end temperatures did tend to result in a lot of stopped pipe trouble with ordinary ascension pipes, and he did not advocate high end temperatures unless Congdon pipes were used.

Mr. H. MOYS (Bromley-by-Bow) said that before the war they studied the expansion of settings both on bringing them into action and on cooling down. In the early days the settings consisted of siliceous retorts carried on silica cross walls and the outside sections were built of fireclay. Various experiments were carried out, but in no case did they succeed, and inevitably the upper tiers of retorts were always tilted. The next stage was to have a silica centre wall and a silica outside wall, still using moulded siliceous retorts, but when the settings were heated up they always found that the section joints between the retorts opened up. Following that their settings were made of all-silica construction—silica centre walls and silica segmental retorts. The bottom half of the settings comprised a special fireclay producer and fireclay regenerator. They examined the retorts for expansion, and in no case did they find that the bottoms of the retorts were lifted to any great extent. The total movement of the top tier was 1½–1¾ in., and the longitudinal expansion was something over 2 in. They tried to accommodate the expansion by means of wedges, but the result was not satisfactory. He did not know whether spring loading was a possible alternative. Allowing ½ in. between the pier walls and 1½ in. between the top of the cross wall and the arch gave a satisfactory result.

Mr. MUIR WILSON thanked Mr. Moys for his very useful contribution.

Mr. C. A. DEAS (New Southgate) asked whether the Author considered that some of the expansion was absorbed in the joints. It looked as if a 20-ft. retort ought to expand 5 in., but if it did it was a surprising amount. Had he in the past, or did he now leave an expansion joint between the silica material and the siliceous or fireclay end? He had seen that done, and his experience was that a space was still left after starting up. What they did was to build a fireclay end right up against the silica. Did Mr. Wilson think an answer to the expansion problem was to be found in having smaller benches consisting of four or five retorts in place of the usual 10 or 20?

Mr. MUIR WILSON said that some of the expansion of the retort segments must be absorbed in the joints because the expansion found in practice was not as much as one would expect by calculation. When they put fireclay ends on their silica retorts they set them up tight. On the question of smaller benches he was sure that if they worked out the expansions properly there would be no end-to-end expansion of the battery and there would be no trouble. He would like to see batteries of between 10 and 15 settings. To subdivide to

a greater degree involved the use of more steelwork and brickwork for end walls, with the result that less settings could be accommodated in the retort house, while the effect of so many extra end walls would be to raise the fuel consumption.

A SPEAKER remarked on Fig. 9. He said that apparently no allowance was made for drying out the setting before heating up started.

Mr. MUIR WILSON replied that we kept new settings below 100°C. with plenty of air going through them for about 10 days before heating up started. The diagram exhibited was only that part of the process which applied to heating up proper. In a setting which had been used before there would, of course, be no 10-day period allowed for drying out. He was glad the speaker raised this point, because it was very important that it should not be misunderstood, in a way which would lead people to believe the 10-day drying out period was unnecessary.

A vote of thanks was accorded to Mr. Muir Wilson on the proposition of Dr. S. Pexton, seconded by Mr. W. R. Farror.

Dr. S. PEXTON, in a written communication, said: Some years ago, when studying the temperature conditions in the girder floor of a bench of continuous vertical retorts, it became apparent that the designers of this particular setting had not built a monolith, but had subdivided the bench so as to allow internally for longitudinal expansion. At certain points in the length of the bench the twin girders running laterally across the setting to form the floor were not compounded as was the case at all other points in the bench. Under conditions of manufacture of high calorific value gas the end pieces compounding the girders into box girders so limited free convection of air between each pair of girders that the upper flanges locally reached temperatures approaching 400°C. The few pairs of twin girders which were not compounded but open at the ends were at least 100° cooler. Thus in a normal engineering practice of compounding girders there resulted a substantial increase in the temperatures to which the metal was subjected. After consulting the designers the particular compounding pieces were removed, with an immediate reduction in metal temperatures and a much increased factor of safety. Subsequently compounding pieces were substituted, which allowed freer convection.

Another feature to which I should like briefly to refer is the vert unsatisfactory practice of burying the top tie bars of intermitteny vertical retorts within the brickwork or in ducts which inevitably become filled with dust. The heat dissipating surface is then merely the exposed ends, and the tie bars inevitably attain the temperature of the surrounding brickwork. There is a further reason for building these tie bars clear of the setting or, if that is impossible, providing water-cooled tie bars—*viz.*, where the settings have internal producers and the tie bars pass in brickwork close to the producers, then uncooled tie bars are chemically attacked by hydrogen sulphide in producer gas, which permeates through the brickwork in the neighbourhood of the producer charging holes.

Finally, the Author, in the concluding paragraph of his Paper, states that "everyone knows that heat penetrates into the mass of a coal charge according to a square law." It does seem to me a matter of considerable importance to the Industry that more precise information on this point should be available. Let me state the question in a more direct form: "Would a coke oven of a width of 8 in. (assuming such a narrow oven could be built) complete its carbonization in 4 hours, if its combustion chamber temperatures were the same as an oven of 16 in. width, completing its carbonization in 16 hours? If so, and other dimensions being equal, the narrow oven would produce twice as much gas per day as the wide oven."

Mr. MUIR WILSON, in reply, wrote: You ask, "Would a coke oven of a width of 8 in. (assuming such a narrow oven could be built) complete its carbonization in 4 hours, if its combustion chamber temperatures were the same as an oven of 16 in. width, completing its carbonization in 16 hours? If so, and other dimensions being equal, the narrow oven would produce twice as much gas per day as the wide oven." My answer to your question is "No," because at such a very fast rate of coking the temperature gradient through the side walls would steepen. The answer is "Yes" provided the temperature is kept the same on the oven face of the side walls. To do this the heating flues would have to be kept hotter and made bigger, so as to provide the heat for carbonizing twice the amount of coal in the same time. In practice the hours lost per day in charging and discharging would increase, so, as the oven narrowed, a point would eventually be arrived at where throughput began to fall off again. Thus it is clear that the width which gives the best throughput is a compromise. The capital cost per oven will increase, but at first will decrease in terms of coal throughput per oven per day. The wear and tear on the oven increases with the number of pushing operations required per ton of coal handled, and a long, high, very narrow oven is not easy to push.

The maintenance of correct temperature on very narrow ovens is extremely difficult because:

(1) The ovens have to be tapered, and 1½ in. of taper on an 8-in. oven means far more in end-to-end temperature differences than 1½ in. of taper on a 16-in. oven, when the square law is considered.

(2) Such heavy fuel-gas and air loading means that the slightest inequality will show up suddenly in dangerously high local temperatures.

(3) The already high heats will run away if there is the least delay in pushing out.

On the other hand, narrow ovens will produce much better and more uniform coke as regards volatile therm content, since the outside layers of coke do not have to stay in the oven so long after they are carbonized, nor will they be so long subjected to graphitic deposition which tends to incombustibility. The coke will be more uniform in size and smaller, which will save wastage and wear and tear associated with cutting. Generally the coke will tend more towards what gas companies require.

When all these points are considered it is extremely difficult to decide on the exact width which is most economical, but I fancy that somewhere between 12 in. and 16 in. mean width is not very far out for gas undertaking practice on Durham coal. This oven width question is one which still needs a very careful investigation. I think the answer will only be arrived at after we have had practical experience with many ovens of different widths, and when ovens have been so improved in design that every part of their heating surface can be so accurately heated as to guarantee that every part of the charge is carbonized in exactly the same time.

Scientists in Peacetime

Last week Dr. E. F. Armstrong, the Chairman of the Royal Society of Arts, addressed the Society on "The Influence of the Prince Consort on Science." In the course of his Address he said that in this country the road to distinction had lain through the humanistic schools of the older universities, with the result that the control of industry and State policy had been largely in the hands of men with little understanding of science. The scientist, if used at all, had been relegated to a subordinate position, and not permitted to make any real contribution to social and industrial affairs.

Science was officially patronized during wartime as the source from which convenient or necessary inventions might be expected; but would it remain in peacetime a mere minister to material ease and facilitated communications? Were scientists to be cast aside again while the lawyer and the accountant played havoc with our industries through sheer ignorance of what industry was? Or was scientific knowledge, scientific method, to be allowed to play a part in technical as well as in administrative matters?

Smith Meters' War Service

The story of the contribution which Smith Meters, Ltd., made to the war effort is revealed in a profusely illustrated 32-page brochure which has been widely circulated among the Company's normal customers who during the war waited patiently for meters and in a measure excused delays. Statistics of war equipment production and reproductions of several letters of appreciation from Government departments tell their own story; what will be most welcome to customers is the indication, afforded by a picture of one of the shops already back to peacetime production, that no time is being lost in an endeavour to overtake the arrears of civilian meter requirements.

Wartime production demanded in many instances the modification of plant, and the installation of additional plant to satisfy the requirements of the fighting forces and the Government. With regard to the latter the Company was by no means embarrassed, for it had behind it a century of meter production under Government seal and wide experience of precision instrument making. Many items essential to the war effort were in manufacture before the war started. As time went on, instead of turning out thousands of meters per week the Company supplied hundreds of thousands of products per day. The specialized plant proved to be indispensable for the products manufactured, and the key staff was able to supply munitions in abundance within specified dates.

The works, covering six acres at Streatham and two acres at Kennington, and an additional requisitioned Government factory, were capable of almost any task the Government cared to impose. Much development work in connexion with new designs was undertaken, and products included those that were vital for the defeat of the enemy. From Streatham there went out many millions of bomb and projectile fuses, service respirator parts, bomb tails and components, and incendiary bomb parts, hundreds of thousands of pistol shear wires and bursters, pistol arming vanes, securing rings, clips for releasing clusters of bombs, and tens of thousands of igniters, aircraft instruments and indicators, gunsight control units, fuse boxes, and various mine components. Kennington produced 12,100 45-gall. tanks for Typhoons, 1,501 30-gall. tanks for Spitfires, 1,400 185-gall. tanks for Wellingtons, and thousands of night-flying goggles, bomb nose and tail units, &c.

The Company's war work was not entirely uninterrupted. The air raid shelters at Kennington had a direct hit from a 500 lb. bomb in 1941; quite a lot of transport equipment was destroyed in incendiary raids in 1942, and high explosive bomb blast extensively damaged the side of the works. Notwithstanding these difficulties the Company was officially commended for establishing new records for speed in output.

This Question of Integration

A Meeting of the Midland Junior Gas Association was held in Birmingham on Oct. 11.

The retiring President (Mr. F. J. Bengough) presided at the outset.

Mr. C. F. W. Rendle (Redditch) was elected an honorary member.

The Milbourne Medal was presented to Mr. C. L. Evans (Birmingham Central Laboratory) for his Paper on "The Production of Sulphur Compounds During Carbonization."

Mr. BENGOUGH, on vacating the chair, said he ought to acknowledge the goodwill of the General Manager and Engineer-in-Chief of the Birmingham Gas Department, which had enabled him to carry out his duties as President. He would also particularly like to thank their old Secretary, Mr. Alfred Hill—who had now been succeeded by Mr. H. J. Reynolds—and members of the Council for their support and help during the difficult period of the war now happily ended.

Mr. Bengough next expressed the pleasure it gave him to hand over the President's Badge to Mr. K. L. Pearce, who had been a most enthusiastic member of the Association for many years and had rendered good service on the Council for a long period.

Mr. PEARCE, having been inducted, said his first duty was to propose a vote of thanks to the retiring President, and he did so with real pleasure, as one who had been actively associated with the work which Mr. Bengough had carried out over a number of years. His work on the Council prior to taking office had been crowned by his activities during his presidency.

The President's Address

Mr. **K. L. Pearce,** in the course of his Address, said: It has been a source of gratification to observe the healthy growth of membership during the past few years, which now brings the total number of members to some 280 in our Midland Association. The future reorganization of the Industry has been the subject of several reports and deliberations by many throughout the length and breadth of the country. One method of possible future developments along which the Industry might proceed which has been put forward has been termed the "integration of gas undertakings." There might be a tendency to think that this is some new development of industrial policy peculiar to present-day conditions. On the contrary, integration of large areas and townships was known in this district over a hundred years ago. During the past few months he had been engaged in a most interesting study of the history of the Bilston Undertaking, which will shortly be celebrating its centenary.

Over a hundred years ago there existed in the Birmingham and Black Country area a large gas undertaking known as the Birmingham and Staffordshire Gas Company. Incidentally this Company no longer exists. The Company embraced a large area, and was responsible for supplies of gas to several towns in the Black Country as well as Birmingham—in fact, we have an example of a completely integrated area of gas supplies. As the years went by this large undertaking became disintegrated, and the different towns in the area set up their own gas-works and administered the supplies in their own area previously administered by the old Birmingham and Staffordshire company. The breaking away of the town of Bilston from this larger undertaking is rather interesting. We find that the gas-works in the town of Bilston from 1826 to 1846 merely consisted of a holder station, the gas being made at the main works some five miles distant from the town and conveyed by connecting mains. The townspeople became very dissatisfied with the supply and decided to form a new gas company, the shareholders of which were all consumers. This they did in 1845. This was followed by the presentation of a Petition to Parliament by the shareholders asking for powers to purchase the existing gas-works and gas mains, and to enable them to complete their own gas production plant in which they would use local coal. The original Petition presented to Parliament is in our possession, and it states clearly the case which the consumers presented on behalf of the township. Their case consisted briefly of the inadequacy and poor quality of the gas supply, the high price of the gas compared with other towns, the inability of prospective consumers to obtain supplies, and the lack of contact which the local consumers had with the Company, whose officials and staff were some distance from the town.

No responsible officer of the Company was resident in the town, thus causing delays in attending to the consumers' demands and complaints. This latter point was much emphasized, and considerable evidence was called to show the poor quality of the service, due to the remoteness of the Company's headquarters. The case for the new company stressed that a reduction in price could be obtained by making the gas in the town and using local coal; also the local interest which the proprietors would have in their own undertaking would result in better attention to the consumers and the development of the supplies, which would enable other inhabitants of the town to become consumers.

The new company was successful with this Petition and was incorporated in 1846. The promises of the petitioners were maintained. The new company reduced the price of gas immediately and developed the output rapidly, which stood at 4¾ million cu.ft. per annum when the company was first formed.

Unification in the Industry

One is tempted to enquire whether the developments of managing the Industry have been so rapid as the occasion has demanded, and whethera ny real advancement has been made over the past decade. There do seem to be lessons that can be learned from the history of the past if we are to try to understand the present or to look into the future. The lessons of past history appear to indicate that it is the responsibility of the Industry, whatever happens in the future, to maintain a high standard of service to the consumer at the lowest possible price of the commodity, and to ensure further technical and administrative advancements are made to see that both requirements are achieved.

Another milestone has been passed with the formation of the British Gas Council, but it is not sufficient to expect that the Industry will be properly managed by sitting back and waiting for a policy to be formulated by the members of our Industry who are engaged in the work of setting up the organization of the British Gas Council. The Industry does not suddenly become properly managed by the setting up of a new national body or giving a new name to an old one. The responsibility must always finally rest on the individual undertakings, and on the sum total of the ability of all undertakings to play their part the efficiency of the Industry will be judged. That a national organization of the Industry is necessary is obvious, and the present policy of unification throughout the Industry of the national organizations under the control of the British Gas Council forms what one might term the spearhead of the Industry. One must, however, remember that the effect produced by any spearhead depends on the strength of the effort behind it. This policy of unification from the national bodies must permeate through the whole of the Industry to each undertaking, and as the success of the whole depends upon the effort of the individual undertaking, so does the strength of the individual undertaking depend upon the efficiency and enthusiasm of the members of its staff and employees. The need at the present time is teamwork.

Personnel

Quite apart from the technical qualifications which every young man in the Industry must have, there are other qualities which he should cultivate to give of his best. Mere examination qualifications are not enough; sound practical experience must always be of considerable importance in such a practical process, and the experience that comes with responsibility is the most valuable. Human understanding plays a very important part and is a necessary quality in dealing with other men, but above all, I would place loyalty as first virtue—loyalty to the Industry, to your employer, and to your colleagues. Loyalty is the essence of teamwork, and with it goes an understanding and appreciation of the other fellow's place in the team and a closer cooperation between departments in the undertaking.

Technical improvements will continue, and means of imparting new developments and practices to undertaking staffs need to be arranged. Refresher courses are not uncommon in other industries and professions, and would fulfil a valuable function in the Gas Industry. The only means at our disposal for imparting information on new developments is by way of Associations such as this or the Technical Press. Could not the Junior Associations consider the provision of facilities for instruction along definite lines of the latest practices and developments when arranging the sessions' programme?

What facilities are there for obtaining instruction in the fundamental principles of management, commerce, accountancy, for the prospective engineer and manager? Many years are spent in obtaining instruction in the engineering side, but the function of management is left to a more haphazard method. After all, any Chief Executive Officer knows that the opportunities of utilizing his engineering experiences are far fewer than the occasions occupied by managerial functions. In the early years of training the young man's time is fully occupied in his engineering studies, and it is difficult to see how any additional instruction could be assimilated. There does seem to be the need for some instruction in the basic principles of management. Again, could not this question be considered by the Junior Associations?

Economics

During the war we have enjoyed a position when the demand for coke has exceeded the supply and prices have been exceptionally high. We cannot expect that condition to continue, and any change in the coke market will have an immediate effect on the net costs of production. It is not my purpose to make a detailed survey of the economics of production, but to bring to notice the importance of the need to be prepared for any changes in our economic structure, and to be in the position to meet them when they occur.

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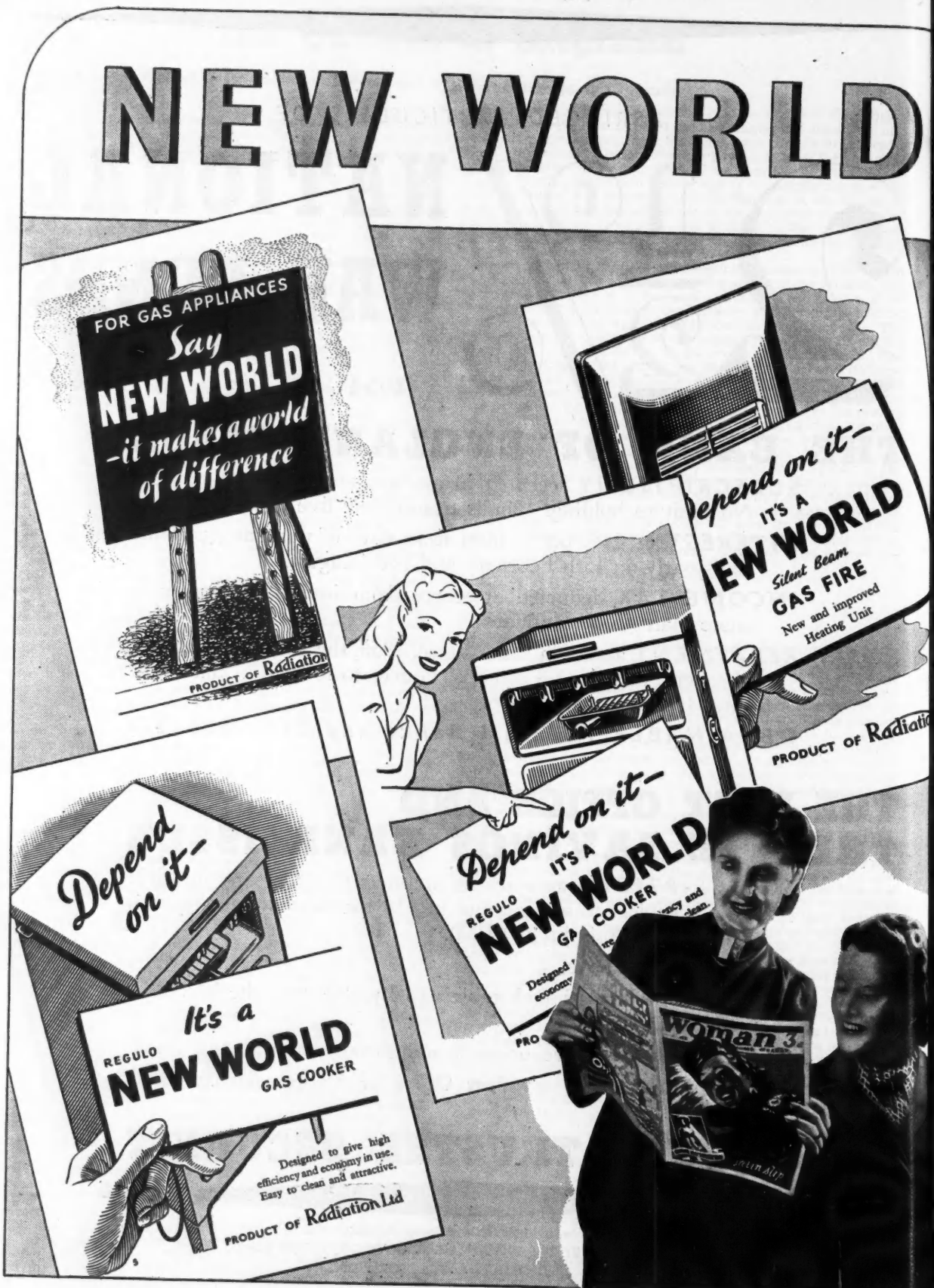
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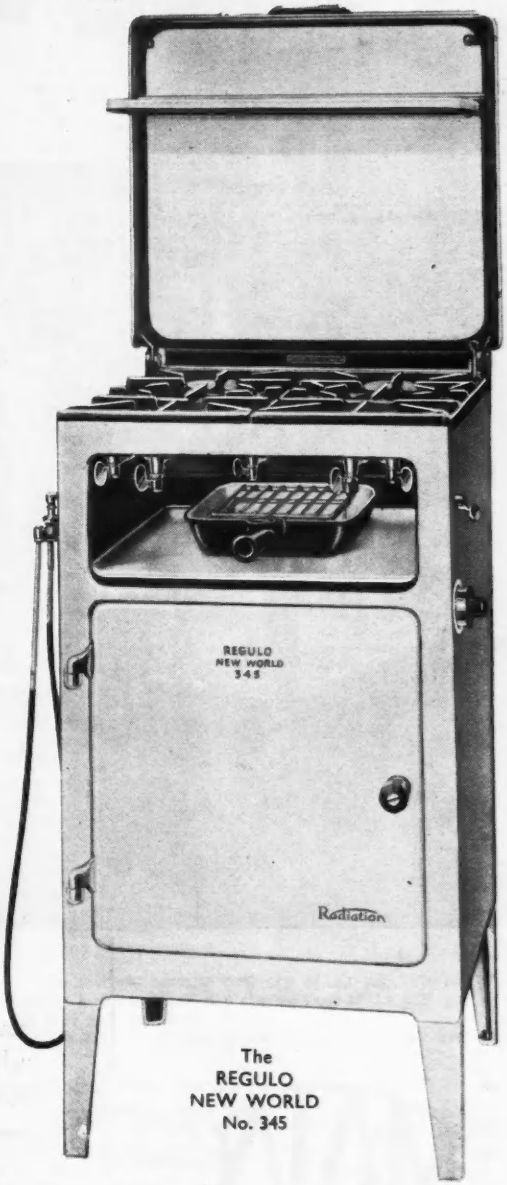

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Distribution

The further use of high-pressure distribution to meet the increasing demands merits careful consideration, particularly in regard to the economics of the two systems of low and high pressure, and the question of the increased cost of labour and materials as compared with power. The developments of gas in rural areas will invariably demand high-pressure distribution. Developments of urban sites will probably merit the same method.

Mr. A. B. BRITTON, President of the Midland Association of Gas Engineers and Managers, in proposing a vote of thanks to the new President of the Junior Association for his sound address, said the outline given by Mr. Pearce of the history of his own undertaking was most interesting. As President of the Senior Association he had been impressed by their activities and the keenness which was shown. This enthusiasm was an inspiration to everyone in the Industry.

Mr. S. BROCKBANK (Walsall) seconded the vote, and welcomed the stress laid on the need for teamwork.

Benzole Recovery by Active Carbon*

By G. W. ROBSON

Morpeth

THE active carbon plant installed at Morpeth Works in 1942 was, I believe, one of the first of its type to be put into operation in this country, and certainly the first in the Northern area. The process is, of course, continuous.

The Morpeth plant has a capacity of 400,000 cu.ft. per day. Each adsorber contains about 3 cwt. of carbon, the whole of it, with the exception of the separator and storage tanks, occupies a floor area of some 400 sq. ft.; the height required in the building is 15 ft. The plant is entirely automatic in operation, and apart from the need to keep a check on the timing of the cycle of operations and lubricating moving parts, requires a minimum of attention.

The component parts of the plant are:

1. Two adsorbers with their operating valves.
2. Benzole condenser.
3. Gas cooler.
4. Gas preheater.
5. Driving mechanism.

Adsorbers.—These are made up of an outer mild steel shell, 2 ft. 6 in. dia. by 3 ft. high, with an inner carbon container formed of metal gauze, the space between the outer shell and the gauze being 3 in. An annular space vertically through the centre of the gauze container forms the gas outlet. For ease of emptying the adsorbers are supported in a position approximately 3 ft. from ground level.

Benzole Condenser.—This is a double unit vertical water tube condenser connected across the inlet of the two absorbers.

Gas Cooler.—This deals with all gas leaving the plant, cooling it down to about 50°F., and is of a vertical tubular design.

Gas Preheater.—A steam coil gas preheater comes into operation, raising the temperature of the stripped gas when this is being re-circulated through the carbon bed for the purpose of drying it out after steaming.

Driving Mechanism.—The main drive, a small high speed steam engine, running at a speed of about 450 r.p.m., operates the air compressor, the re-circulating gas fan, and the timing and valve-operating mechanism. Inlet and outlet valves to the adsorbers and valves controlling the re-circulating gas and steam valves are automatically operated by compressed air.

There are three periods in the complete cycle of operations of each adsorber. First, the adsorbing period when gas is passed from the outer space between the adsorber shell and the carbon, through the carbon down the annular centre space, through the gas cooler, and on to the station meter. Second, the steaming period, when steam is admitted to the carbon bed and the resulting benzole and water vapour is directed into the condenser, the benzole and water being separated in the normal way. Here I would like to point out that the efficiency of the carbon is gradually reduced by a formation in the pores of resinous bodies resulting from the polymerization of unsaturated hydrocarbons; the depreciation of the carbon is minimized by passing the steam through the bed in a counter direction to the gas flow.

The third period is the drying period. During this period stripped gas is picked up from the outlet of the plant by means of the fan and re-circulated through the carbon, after having passed through the pre-heater and its temperature being raised 60°–70° F. above normal gas temperature. In this way all traces of moisture remaining after steaming are eliminated.

The longest complete cycle occupies two hours, and is divided up as 60 minutes adsorbing, 30 minutes steaming, and 30 minutes drying. The shortest cycle is of 20 minutes' duration, divided up in the same ratio. The timing is arranged so that one adsorber is dealing with benzolized gas, while the other is steaming out and then drying.

The length of the adsorbing period depends upon the activity of the carbon. As I have said, the longest period is of one hour, and this can be automatically reduced to any desired length down to 10 minutes, the deciding factor being the "break point," or that point at which the carbon has become fully charged with benzole and the flame at a test burner on the outlet of the plant begins to show the presence of benzole in the gas. Complete stripping of the gas results in a non-luminous flame being produced. The length of time given to the adsorbing period is determined by the "break point." A falling-off in efficiency of extraction when down to the lowest time cycle indicates a complete change of carbon being required. Spent carbon is returned to the makers for reactivation.

Grain size of the carbon used in this plant is between $\frac{1}{16}$ and $\frac{1}{8}$ in.

The following figures will indicate the performance: To date 13 charges have been used and have had varying lengths of time in operation. The longest lived lasted 160 days and dealt with 23 million cu.ft. of gas, equivalent to 1,900 tons of coal carbonized. The average recovery over the whole life of the charge was 2.1 gall. per ton. The shortest life was of 61 days' duration, dealing with some 11 million cu.ft. and giving an average recovery of 1.93 gall. per ton. The charge giving the best results lasted 112 days, dealt with 18½ million cu.ft., equivalent to 1,500 tons, recovered 3,750 gall. of benzole, an average recovery of 2.45 gall. per ton. The carbon was not entirely spent at this point, but recovery had fallen to below 2 gall. per ton, and it was decided to change the charge. Experience has indicated that the general life of one charge is about 100 days.

An attempt to re-activate spent carbon was made on the works, but proved to be ineffective, recovery of benzole falling off rapidly after three or four days.

Tests of efficiency of extraction have given varying results, depending, I think, on the length of time the carbon had been in use, but usually it has averaged 90%. Benzole content of the gas at the inlet to the plant has consistently yielded a figure in the region of 2.9 gall. per ton, and the best extraction over any period has been of 2.8 gall. per ton. The makers suggest a 99.9% efficiency, and I have no doubt that this would be obtainable by keeping a very close watch on the plant, and with more chemical supervision than can be given on a small works.

One of the effects of this active carbon recovery is a considerable reduction in the organic sulphur content of the town gas. At Morpeth the sulphur in the gas at the outlet of the holders has been in the neighbourhood of 6–7 grains per 100 cu.ft.—an efficiency of extraction of some 60%.

Naphthalene is entirely eliminated from the gas, and anyone having experienced the trouble which can occur on the district due to its presence will readily appreciate the advantages to be derived from its elimination.

The following is an analysis of crude benzole taken in February, 1945:

Percent. distilling at 100°C.	81
" " at 160°C.	97
Benzole fraction	69.2%
Toluole fraction	15.6%
Xylole fraction	5.2%
True toluene content	14.7%

On a crude benzole recovery of 2.5 gall. per ton the above shows a recovery of once run benzole of 2.4 gall. and of toluene of 0.37 gall. per ton.

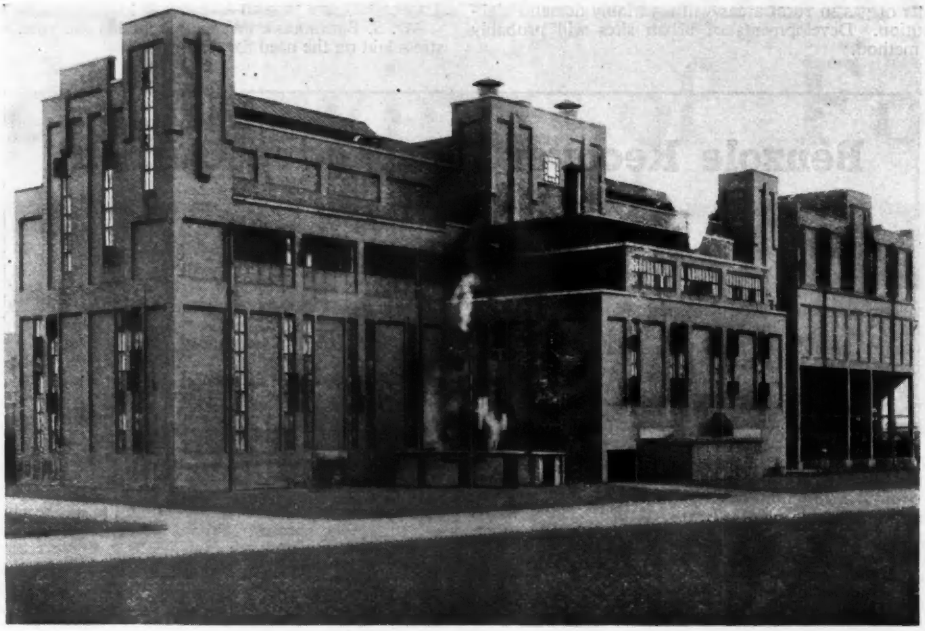
The sulphur content of the benzole is slightly over 1%.

Conditions Affecting Recovery

1. It is essential that there should be an adequate supply of cooling water (100 gall. per gall. of benzole is a suggested quantity). At Morpeth this is pumped from the nearby river to an overhead storage tank, which was in use prior to the installation of the plant as a source of supply for boilers, coke quenching, &c. A considerable amount of this cooling water, after passing through the plant, is now directed to a boiler feed tank, and by using a steam coil and exhaust steam from the benzole plant engine, boiler feed water is preheated to some 160°–170°F.

2. The admission of the correct amount of steam to the adsorbers is not so vital. On this plant there is no method of telling whether or not the charge has been adequately stripped, apart from observing the test flame when the cycle changes from steaming to drying, and

* Paper to the North of England Gas Managers' Association (Auxiliary Section).



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COMMUNICATION No. 230—PROCEEDINGS OF THE INSTITUTION OF GAS ENGINEERS 1939–40, p. 455.

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by measuring the amount of benzole recovered over a given period. A rough guide to the amount of steam required for any time cycle is to feel the steam breaking through to the adsorber shell when one third of the way through the steaming period. It has been ascertained by tests that the amount of steam used on the adsorbers varies between 4½–5 lb. of steam per lb. of benzole recovered.

3. Drying out of the charge after steaming has a great bearing on the life and activity of the carbon, so that it is necessary that the re-circulated gas should be heated to, say, 70°F. above the normal gas temperature, so ensuring the elimination of any moisture remaining in the carbon after steaming. It was discovered in one case that chilling of the adsorbers was taking place due to their exposed position; deposition of moisture in the carbon caused recovery to fall off very rapidly. Some form of lagging round the adsorber shell effected a cure.

4. Naphthalene in the inlet gas has no apparent affection for the carbon, in fact the plant acts as a most efficient naphthalene remover.

5. With a varying steam pressure which can occur when boiler firing is part of the shift stokers' duties, it is possible to get a variation in the timing of the cycle from hour to hour. This will have some effect on recovery, possibly not to any great extent, although the majority of plants now operating have an electric motor as their main drive.

6. Attention must be paid to the test flame to ascertain that the adsorbing period is not being carried beyond the "break point," and to ensure that adequate steaming is taking place.

A typical example of the length of each time cycle during the life of a charge, taken from actual working, is as follows. Starting with new carbon the 60 min. adsorbing cycle lasted 22 days,

40	,,	,,	,,	,,	28	,,
30	,,	,,	,,	,,	20	,,
24	,,	,,	,,	,,	12	,,
20	,,	,,	,,	,,	12	,,
15	,,	,,	,,	,,	10	,,
10	,,	,,	,,	,,	8	,,

Cost

When so much has been said recently about the costing of various processes, I rather hesitate to put forward an attempt at arriving at the cost per gall. of benzole recovered. One or two charges, of course, stand out. First, the cost of carbon; this, over the last three years, has been 1d. to 1.3d. per gall. of benzole. Repairs to the plant itself have been practically *nil*: the whole has amounted to one new diaphragm for a valve, and two sets of ball races for the re-circulating fan. Practically all the expense has been incurred in the repair and maintenance of the steam engine. The cost of raising steam to drive the engine and for the adsorbers is rather difficult to assess. The works, being small, do not run to three shifts of boiler men, boiler firing being included in the duties of the retort house personnel. On increasing the work of boiler firing due to the installation of the plant, there was an immediate outcry for a reduction in retort house work. When this point was finally settled the cost of raising extra steam for the plant could only be assessed as being equal to the reduction of work done in the retort house. This is one indication of what can occur with a so-called labourless plant—the steam-raising costs can be so easily hidden in the works total cost of steam raising.

The price of new carbon at £100 per ton appears to be a very high figure, and the reactivating of the carbon is done by the manufacturers at £55 per ton. This figure would appear to be very high also.

Brief Summary of Running Costs

Carbon	1.0d.	per gall.
Steam raising and attention to plant	4.0d.	,,
Lubrication	0.08d.	,,
Cost of pumping cooling water	0.25d.	,,
Total	5.33d.	,,

In addition to this, of course, must be taken running repairs to the steam engine and other moving parts. It is therefore apparent that benzole cannot be manufactured on this particular plant at less than 6d. per gallon. In case these figures tend to mislead anyone regarding the true cost of producing benzole, I would point out that they are given to indicate the general day-to-day cost. A complete balance-sheet would have to include in addition:

1. The thermal equivalent of the benzole (1.4 therms per gall.) taken at the cost of producing these therms would be in the region of 5.0d. per gall.
2. Interest and depreciation on capital (in the case of Morpeth plant total expenditure was £1,400). Allowing 10% for this, the cost per gall. equals 2.8d.
3. Cartage of benzole from the works = 0.75d.
4. Repairs have amounted to 3.6d.

This gives a total cost of 17.48d. From the foregoing it will be seen that the plant does not operate at a big profit.

Effects on the Works and District

In recent years, due to the shortage of skilled labour and the ever-increasing output of gas, the prospect of operating a plant which would reduce the quantity of gas made per day or increase the number of retorts to be charged per day did not appeal very much. It has, however, been a blessing in disguise, as conditions in the retort house have improved considerably since the installation. Morpeth retorts are stop-ended, and to reduce the calorific value of the gas to 475 meant that overpulling took place, with the consequent indrawing of air, firing of charges, and choked ascension pipes. During the last three years choked pipes have been reduced considerably; a reasonably steady vacuum can now be maintained with retorts working at about level gauge, as gas at the inlet to the plant must be maintained at 500 B.Th.U.

The elimination of naphthalene from the gas had a marked effect on the district. Stoppages and partial stoppages of services are now few and far between, although for a period of about two months after starting up, service stoppages were being reported in numbers daily. I presume that this was due to the fact that gas free from naphthalene was picking up naphthalene from the mains and services, leaving a dry, rust-like deposit, which was being carried along, causing choked service pipes. When these initial difficulties were overcome no further trouble was encountered, resulting in a great saving in time and labour in the Distribution Department.

In conclusion I would remark that I cannot visualize a plant giving less trouble and being more easily run than this active carbon plant, in addition to which there are no waste products with which to contend.

The Sports Association connected with the gasholder and constructional engineering firm of Clayton, Son & Co., Ltd., held its presentation supper on Oct. 12. The Hartley Angling trophy was presented to Mr. J. Bentley, and the Cawthorne Swimming trophy—for the second year in succession—to Mr. T. Brown. The Cricket Section reported a successful season. Playing in the Senior Division of the Leeds and District Cricket League, the first team finished third in the league table. The first team also reached the semi-final of the League Cup Competition. The Association Football Section had so far won 4 of the 5 games played.

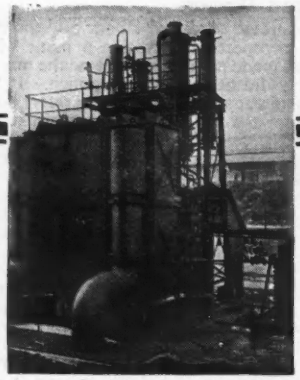
As a Temporary Expedient to overcome arrears of work, the Glasgow Corporation Gas Department has been forced to put its meter readers out on Sundays, a decision not previously experienced in the Department. The reasons for this step are all bound up with the shortage of labour. Women meter readers who rendered valuable service over the war years are now leaving the service with the return of their husbands from war duties. The ten-year consumption survey, recently completed, also withdrew labour from its normal routine, while there has been a big increase in the consumption of domestic gas.

Members of the Institution of Gas Engineers and of the Gas Research Board are invited to attend a series of Papers on "Industrial Waste Heat Recovery," organized by the Institute of Fuel. Attention is drawn particularly to the Paper on "Utilization of Waste Heat in the Carbonizing Industries," to be presented by Dr. J. G. King and Dr. F. J. Dent on Jan. 16, 1946, in Sheffield, and on Feb. 21, 1946, in Nottingham.

The Copper Development Association, which during the war operated principally from a temporary office in Rugby, has now acquired premises at Kendals Hall, Radlett, Herts. All urgent communications and applications for the Association's literature should be addressed, in future, to Radlett. The Association will continue to maintain its registered address at Grand Buildings, Trafalgar Square, London, W.C. 2.

Sir Peirson Frank, in his Presidential Address to the Institution of Civil Engineers on Tuesday, November 6, dealt with civil defence operations which took place in the London Region during the war. Gas undertakers, he mentioned, had to deal with a large number of fractured mains, as the total was 11,902, of which 831 were more than 12 in. in diameter; 50% of the incidents occurred on the Gas Light and Coke Company's system, and they had the responsibility of repairing 63% of the larger mains. All the large London gas-works suffered damage at one time or another, the greatest difficulty being caused by the loss of holder-capacity. One incident gave particular trouble. A flying bomb hit a tar distillery plant in South London, and ¼ million gallons of tar were ignited. The tar, still blazing, flowed into and for about 200 yards along an adjoining highway. The highway was covered to a depth of 18 inches in some parts, and entrances to some premises were out of use for some days.

To Assist in the effective application of wartime development to peacetime production, the Quasi-Arc Company, Ltd., Bilston, has published the *Quasi-Arc Welding Manual* (3s. 6d.). During the war years arc welding has been applied with success to an ever-increasing variety of metal constructions, and much specialized training has been provided, but as the change is made from war to peace, many welders, as well as designers and engineers, are likely to experience the need for a wider knowledge of the subject. The *Manual* has therefore been produced partly to provide the novice with advice and instruction in all spheres of arc welding; partly for the welder who has had to concentrate on a narrow field of application and now wishes to widen his knowledge, and partly as an aid to the welding shop supervisor and those engineers concerned with the design of welded fabrications.



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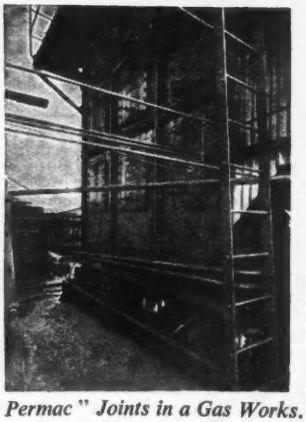

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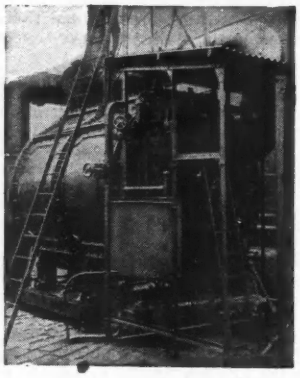

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Products Prices—Stocks and Shares

The London Market Nov. 12.

There are no changes to report in the prices of Coal Tar Products.

There have been two developments of interest in connexion with Coal Tar Products, the first being the cancellation of Government contracts for toluene, and the second the issue of the Control of Benzole and Allied Products Order, 1945 (S. R. & O. 1945, No. 1064), which came into force on Sept. 1 and brings all Coal Tar Spirits under one and the same Order.

As from March 5, by the Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), the maximum price of Pitch for briquetting has been increased to 60s. per ton f.o.r. supplying works, and the prices for Road Tar, as fixed by the Coal Tar Products Prices Order, 1943, S. R. & O. No. 1528, have been increased by one half-penny per gallon. There is also an increase of 5s. per ton in the price of standard Creosote/Pitch Mixture.

Coal Tar Products Prices (No. 2) Order, 1944 (S. R. & O., 1944, No. 1051), allows increases in the maximum prices for all forms of Naphthalene.

The Provinces Nov. 12.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 90's. 2s. 4d. to 2s. 6¼d., pure, 3s. 2¼d. Carbolic acid, 60's, anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.), and strained anthracene oil controlled by the Coal Tar Products Prices Order, 1943, dated Oct. 20, 1943 (S. R. & O. 1943, No. 1528), operative from Nov. 15, 1943, Naphthalene controlled under S. R. & O. 1944, No. 1051, operative from Sept. 22, 1944.

Attention is called to Coal Tar Products Prices Order, 1945 (S. R. & O. 1945, No. 229), referred to on p. 305, "JOURNAL" of March 7.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note on p. 396 of the "JOURNAL" for Sept. 10, 1941.

Scotland Nov. 10.

Market continues healthy with inquiries numerous. Refined tar*: Yield to distillers is 5d. per gallon *ex* Works, naked. Creosote oil: Timber preserving quality,* 5½d. to 6½d.; hydrogenation oil,* 5½d.; low gravity or virgin oil,† 7½d. to 7½d.; benzole absorbing oil,* 6½d. to 8d. per gallon. Refined cresylic acid* is 3s. 6d. to 4s. 6d. per gallon *ex* Works, naked, according to quality. Crude naphtha†: 7d. to 8d. per gallon. Solvent naphtha*: Basic prices delivered in bulk, 90/160 grade, 2s. 10d., and 90/190 Heavy naphtha, Unrectified, 2s. 0½d.; Rectified, 2s. 4d. per gallon. Pyridine†: 90/160 grade, 13s., and 90/140 grade, 15s. per gallon.

* Price controlled. † Uncontrolled.

Turnover in the markets was only of moderate dimensions last week. British Funds were weaker, but a few features appeared among industrials, Cable and Wireless ordinary being again in strong demand. Iron and steel shares were also supported.

The volume of business among gas stocks and shares was a trifle heavier, and there were more price changes than for the past few weeks. In the Official List the best rises were those of South-Eastern Gas Corporation ordinary shares which closed 9d. higher, while Colonial Gas Association 8% preference hardened 1s. A feature was the sharp rise of 15 in East Wight ordinary, which changed hands in the Supplementary List at 119½.

The following prices changed last week:

OFFICIAL LIST		
Colonial Gas Association Ord.	17/—19/—	+–/6d.
Ditto 8 p.c. Pref.	23/—25/—	+1/–
Commercial Ord.	62—67	+2
Gas Consolidation "B" Ord.	22/3—23/3	+–/3d.
Imperial Continental	117—122	–1
Liverpool Ord.	122—127	–1
Montevideo Ord.	111—116	–4
Primitiva Holdings Ord.	12/9—13/9	–/3d.
South-Eastern Gas Corporation Ord.	20/9—21/9	+–/9d.
South Metropolitan Ord.	92½—95½	+½
South Suburban 3½ p.c. Red. Pref.	95—100	+2
United Kingdom Gas Corporation 4½ p.c. 1st Cum. Pref.	21/9—22/9	+–/3d.
SUPPLEMENTARY LIST		
East Surrey 6 p.c. Cum. Pref.	123—128	–4
East Wight Cons. Ord.	115—120	+15
PROVINCIAL EXCHANGES		
Derby Cons.	132—137	–3
Ditto 4 p.c. Deb.	98—103	+1

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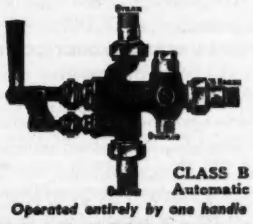

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FOR SALE.—Ironwork from Horizontal Bench comprising 24 Mouthpieces and doors (20½ in. by 15 in.), 24 Ascension, bridge and dip Pipes for Settings of 6 Retorts per bed. 20½ by 18½ Hydraulic and 10 in. Foul Main, 10 in. Retort House Governor. All in good condition.

Apply No. 9497, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

FOR SALE.—2 PURIFIERS by Walker, about 750,000 per day dry Lute.

1 GAS ENGINE-GENERATOR, 55 Kw., 220 volt, DC, driven by National Engine about 80 h.p., like new.

1 Steel Plated HOPPER, covered top, 24 ft. by 8 ft. by 8 ft.

Mayer Newman & Co., Ltd., Arundel House, Arundel Street, London W.C. 2.

TO FACTORY OWNERS AND OTHERS

GOVERNMENT SURPLUS BENCHES. With the progressive closing down of Government War Factories, large quantities of second-hand heavy timber benches of solid and durable construction will from time to time become available for disposal in various parts of the country. A limited quantity is available for immediate delivery. The Benches, which are of varying types, condition and sizes up to 12 ft. long, 4 ft. wide, 3 ft. high, with 1½-in. to 3 in. tops, suitable for assembly, packing and general purposes, will be for sale in minimum quantities of a dozen, and prospective purchasers should furnish particulars of their present or future requirements, giving quantities and approximate sizes, when further details with prices will be supplied as surpluses become available. Apply to Controller of Supplies, Ministry of Works, Union House, St. Martin's-le-Grand, London, E.C. 1, and mark envelope "Section P2/A Benches."

"KLEENOFF"

—THE COOKER CLEANER

Tins for Sale to Consumers. In Bulk for Works Use

OXIDE OF IRON.

BALE & CHURCH, LTD.

33, ST. MARY AT HILL, LONDON, E.C.3.

Telephone: Mansion House 1134. Telegrams: "Balefire, London."

TROTTER, HAINES & CORBETT LIMITED

FIRE-CLAY & BRICKWORKS STOURBRIDGE

GAS RETORTS in BEST STOURBRIDGE QUALITY also SILICIOUS QUALITY 81% SILICA

HIGH GRADE INSULATING QUALITY FIREBRICKS

REGENERATIVE TUBES & TILES

PUBLICATIONS

GAS ACCOUNT CALCULATORS

SUPPLIED either by Price per Therm or Thousand, for any specified Calorific Value, in book form, office charts, or pocket charts for Meter Inspectors, printed in clear type. Write for particulars to F. H. WAKELIN, LTD., Calculator Specialists, 354, WHEELER STREET, BIRMINGHAM.

'Phone: Northern 0989. 'Grams: Reckoners, B'ham.

APPOINTMENTS WANTED

APPOINTMENT required as ENGINEER AND GENERAL MANAGER with Gas Undertaking of repute. Fully qualified Engineer, A.M.I.Mech.E. 20 years' managerial experience.

Those interested kindly communicate with No. 9494, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

APPOINTMENTS VACANT

None of the situations advertised in these columns relates to a man between the ages of 18 and 50 inclusive or a woman between the ages of 18 and 40 inclusive, unless he or she is excepted from the provisions of the Control of Engagement Order, 1945, or the vacancy is for employment excepted from the provisions of that Order.

THE WANDSWORTH AND DISTRICT GAS COMPANY

APPLICATIONS are invited from suitably qualified persons to take charge of the HOME SERVICE DEPARTMENT and conduct COOKERY DEMONSTRATIONS.

Applicants must have a good general education, hold a recognized Diploma in Domestic Subjects, and have had previous experience in conducting Lectures and Demonstrations.

The commencing Salary offered is £300 per annum, and the successful candidate will be required to pass a medical examination.

Applications, accompanied by *copies* of not more than two recent Testimonials, should be made to the undersigned not later than November 30, in an envelope endorsed "Home Service."

Fairfield Street, Wandsworth, S.W. 18. October 26, 1945.

C. M. CROFT, Director and General Manager.

WANTED.—Fully experienced (*a*) **GAS FITTER,** (*b*) MAIN AND SERVICE LAYER. District Union Rate 1s. 10½d. per hour.

Application, stating Training and Experience, should be sent to the Manager, Gas-Works, Okehampton, Devon.

SEVERAL experienced GAS FITTERS required. Union rates of pay. Write, giving Age, Experience and when available, to Engineer and General Manager, Tunbridge Wells Gas Company, 44, High Street, Tunbridge Wells.

SECRETARY wanted for a progressive statutory gas undertaking. Annual sales one thousand million cubic feet. Applicants must be fully experienced, and have an outstanding personality necessary to successfully maintain contacts and conduct negotiations. Apply, stating Age, Training, Qualifications, Salary required and when available, to 9493, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

(Classified Advertisements continued on p. 694)

APPOINTMENTS VACANT (ctd.)

SEVERN VALLEY GAS CORPORATION, LTD.

CHEMIST

APPLICATIONS are invited for the above Position at a Salary of £330 per annum (inclusive of War Bonus).

Applicants must possess recognized Technical qualifications and have received practical Gas-Works training.

Applications, addressed to the undersigned, should be received not later than December 1, 1945, and should be accompanied by *copies* of Testimonials.

Gas-Works, Cheltenham. R. S. SNELLING, General Manager.

SPALDING URBAN DISTRICT COUNCIL

(GAS DEPARTMENT)

APPLICATIONS are invited from persons with the appropriate qualifications for the appointment of GAS ENGINEER AND MANAGER as from April 1, 1946.

Applicants should have experience in Works Management and Gas distribution in Urban and Rural Areas. The successful candidate will be responsible for the control and development of the Council's Gas Undertaking, subject to direction by the Gas Committee.

The commencing Salary will be £600 per annum based on a sale of 150 million cubic feet per annum, rising by £25 for each complete increase of 25 million cubic feet per annum to a maximum of £800, plus house and other emoluments valued at £99 per annum and the appropriate Cost of Living Bonus (now £59 16s. per annum). The Engineer is required to provide and maintain a motor car for use in connexion with his duties, for which a travelling allowance of £50 per annum is made.

The appointment will be subject to the provisions of the Local Government Superannuation Acts, and will be determinable by three months' notice on either side. A medical examination will be necessary.

Forms of application can be obtained from me, and must be completed and returned not later than December 5, 1945.

11, Market Place, Spalding, Lincs. RAYMOND W. HASTINGS, Clerk of the Council.

CITY OF COVENTRY

(GAS UNDERTAKING)

APPLICATIONS are invited from suitable qualified persons for the following appointments:

SHIFT ENGINEER.

Applicants must have a good general knowledge of modern gas-works practice, including the control and operation of continuous vertical retorts and carburetted water gas plant.

TECHNICAL ASSISTANT—DISTRIBUTION DEPARTMENT.

Applicants must have a thorough technical knowledge and experience of high and low pressure distribution, and be competent draughtsmen capable of preparing drawings and estimates relative to the Distribution Department.

DRAUGHTSMAN.

Applicants must have an all-round experience of gas plant design and structural work, also be capable of taking out quantities and preparing specifications.

The salary for each of the above positions will be Grade S.1 of the Corporation's Salary Scale, which is £350, rising to a maximum of £400 per annum by annual increments of £10, subject to satisfactory service. In addition, a cost of living bonus is in operation which, at present, amounts to £59 16s. per annum.

The successful applicants will be required to pass satisfactorily a medical examination, and to contribute on a statutory basis to the superannuation fund under the Superannuation Acts, as amended in regard to annuities to widows by the Coventry Corporation Act, 1936. They will also be required to contribute to the Staff Widows' and Orphans' Pension Scheme.

Applications, stating Age, Experience, Qualifications, &c., together with position in relation to the National Service Acts and Essential Works Order and with *copies* of two recent Testimonials, should be addressed to the undersigned so as to be received not later than November 24, 1945.

Gas Department Offices, Hill Street, Coventry. JOHN E. WAKEFORD, M.B.E., Engineer and Manager.

RUGBY GAS COMPANY

TWO Gas Fitters required, 1st Class City and Guilds Certificate essential. Present rate 2s. 3d. per hour, 47-hour week. Superannuation, Co-partnership. State position with regard to Essential Works Order.

Apply to Engineer and Manager, Gas Offices, Railway Terrace, Rugby.

THE BATH GAS COMPANY

APPLICATIONS are invited for a DISTRICT INSPECTOR. Applicants must have Technical Knowledge and Practical Experience, and be capable of preparing estimates and supervising men. Applications, stating Age, Qualifications, Experience and particulars of present employment, together with *copies* of not more than three Testimonials, should be received by the undersigned not later than Monday, November 26.

18–19, Old Bond Street, Bath. CHARLES BATEMAN, General Manager.

WANTED.—Experienced Gas Fitters. Standard rates of wages paid. Apply, giving Experience, present position and references, to

Bath Gas Company, 18–19, Old Bond Street, Bath. CHARLES BATEMAN, General Manager.

MECHANICAL PLANT FITTER required on a gas-works in the Home Counties for general repairs to steam engines and turbines, exhausters, pumps, compressors, &c. Applicant should be an experienced machinist. Wages 2s. 2½d. per hour minimum, or according to ability. Apply, stating Age, Training and Experience to No. 9498, "GAS JOURNAL," 11, Bolt Court, Fleet Street E.C. 4.

BLACKSMITH required for a gas-works in the Home Counties. Wages minimum 2s. 0½d. per hour according to ability. Apply, stating Age, Training, and Experience to No. 9499, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

EXHAUSTER ATTENDANT AND BOILERMAN required on a gas-works in the Home Counties. Wages for seven 8-hour shifts, £6 10s. per week, including War Bonus. Apply, stating Age, Training and Experience to No. 9500, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

MACHINIST required for lathework, &c., in the machine shop of a gas-works in the Home Counties. Wages minimum 2s. 0½d. per hour or according to ability.

Apply, stating Age, Training and Experience to No. 9501, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

APPLICATIONS are invited for the Position of WORKS FOREMAN. Preference will be given to applicant with knowledge of Horizontal Retorts and electrically-driven charging machinery. Wages will be paid at the rate of £4 10s. per week, plus War Bonus, now £1 3s., with house, coal and gas free.

Applications, stating Age, Experience and present position in relation to Essential Works Order, enclosing *copies* of recent Testimonials, should be addressed to the undersigned not later than December 1, 1945.

Gas-Works, Saltisford, Warwick. W. H. REED, Engineer and Manager.

THE DAWLISH GAS AND COKE COMPANY, LTD.

ENGINEER AND MANAGER

APPLICATIONS are invited for the Appointment of ENGINEER AND MANAGER, at a commencing salary of £450 per annum.

Applications, addressed to the Chairman at 10, Park Road, Dawlish, stating Age, Qualifications and Experience, together with information as to position in relation to National Service Acts and Essential Works Order, and accompanied by three recent Testimonials, should be received not later than December 4, 1945.

10, Park Road, Dawlish.

November 7, 1945.

STRETFORD AND DISTRICT GAS BOARD

APPLICATIONS are invited for the Post of CHIEF CHEMIST with full knowledge of Works Laboratory routine, tests and plant control. Experience in horizontal settings is essential. Commencing salary £450 per annum plus current cost of living war bonus £59 16s. Applicants will be required to state Age, Experience and Qualifications, and also furnish copy of two recent testimonials. The appointment will be subject to the provisions of the Local Government Superannuation Act, 1937, and the person selected will be required to pass a medical examination.

Applications should be delivered to the undersigned not later than the first post on Monday, November 19, 1945.

Gas-Works, Longford Road, Stretford. JAMES CARR, Engineer, General Manager and Clerk.

November 5, 1945.

FOREMAN OF FITTING DEPARTMENT

APPLICANTS are invited for the above Position at a works in the Manchester area. Applicants should have had experience in the manufacture of Gas Governors, Retort House, Station and District, and be capable of taking full control of the Department.

Apply, stating salary required, Age and Experience and position in relation to the Essential Works Order to No. 9496, "GAS JOURNAL," 11, Bolt Court, Fleet Street, E.C. 4.

SKIPTON URBAN DISTRICT COUNCIL

(GAS DEPARTMENT)

APPLICATIONS are invited for the Position of WORKS FOREMAN. Applicants must be experienced in the operation of Machine Charged Horizontal Retorts, Benzole Plant, and in the control of men. Salary £4 15s. per week, plus War Bonus at J.I.C. rates, and free house, coal and gas. The person appointed will be required to pass a medical examination.

Applications stating Age, Training and Experience, and position regarding the Essential Works Order, together with *copies* of two Testimonials, should be received by the undersigned not later than Tuesday, November 20, 1945.

Gas Offices, Cavendish Street, Skipton. J. McNAIR, Engineer and Manager.

CITY OF NOTTINGHAM

APPOINTMENT OF GAS ENGINEER AND MANAGER OF THE CORPORATION'S GAS UNDERTAKING

THE Nottingham Corporation invite applications from qualified Gas Engineers for the Position of ENGINEER and MANAGER of their Gas Undertaking.

Applicants must be Corporate Members of the Institution of Gas Engineers, having a sound experience in the control of all Departments of a large Gas Undertaking, including Works and Distribution, have practical experience of Modern Gas Manufacture, Coke Oven intake, Water Gas Plants, Tar Distillation, Benzole Extraction, and Liquor Ammonia Manufacture, and be capable of preparing designs and specifications for Gas-Works Plant and Structural Work.

Applicants must also have had thorough commercial experience.

The gentleman appointed will be responsible to the Gas Committee of the Corporation for the control and management of the Undertaking, and will be required to devote his whole time to the duties of the Office. He will not be allowed to engage, either directly or indirectly, in private work of any kind. He will be required to live in the City.

Applications accompanied by *copies* of three recent Testimonials must reach me not later than December 15, 1945, in a sealed envelope, endorsed "Engineer and Manager, Gas Undertaking."

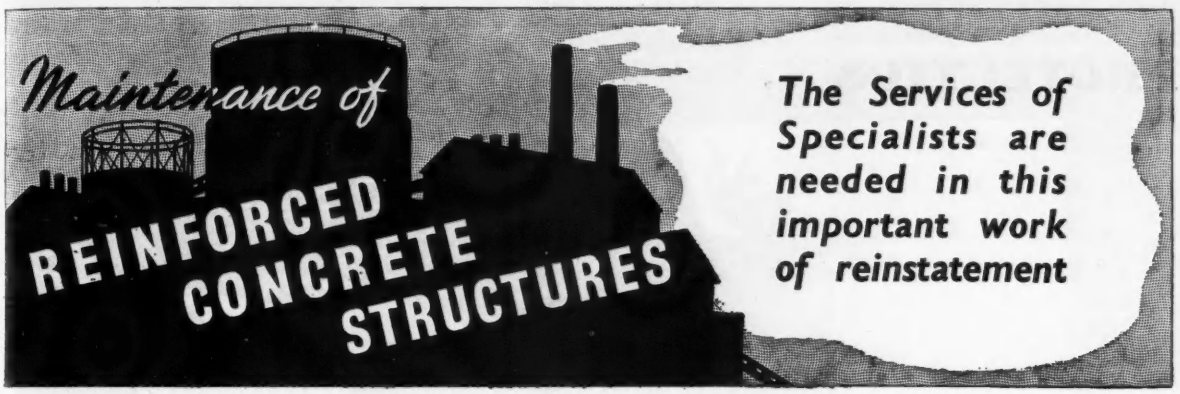
The salary will be £1,750 per annum plus temporary war bonus, which at present is £33 16s.

The appointment is subject to the Local Government Superannuation Act, 1937, and the successful candidate will be required to pass a medical examination before taking up his duties.

Canvassing members of the Corporation, either directly or indirectly, is prohibited and will be a disqualification.

The Guildhall, Nottingham. J. E. RICHARDS, Town Clerk.

November 6, 1945.


Maintenance of
REINFORCED CONCRETE STRUCTURES
The Services of Specialists are needed in this important work of reinstatement

POSSIBLY in no other industry are important concrete structures so prone to the damaging and disintegrating effects of chemical action as in the Gas Industry.
The reinstatement of such plant forms part of the specialised work of Quickset Water Sealers Ltd. Their unique experience not only ensures that the right type of materials are used, but that highly skilled men apply them by methods which have been proved to be entirely efficient.
The Company is prepared to investigate any defective structure, make recommendations and supply the most suitable compounds for the necessary remedial measures, or submit a quotation for carrying out such work. Enquiries from executives of the Gas Industry are invited.

QUICKSET WATER SEALERS LIMITED
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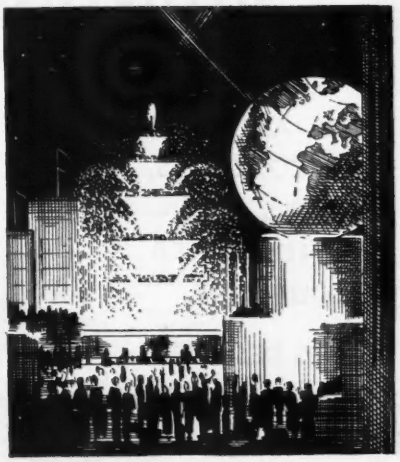
Only time can decide where and when the next World's Fair will be held. No matter where this may be, in the interests of our vital Overseas Trade, British Goods will be to the fore, outstanding in Craftsmanship, Skill and Colour. The last named is of course our speciality, and we would invite all those manufacturers who intend to make "colourful products" to contact our advisory technicians. They are always at your call, and can we feel sure, be of considerable assistance.



Makers of Portables, Spray Guns, Booths, Ducting Compressors, Automatics, Fans, Hose, Air Rectifiers, etc.

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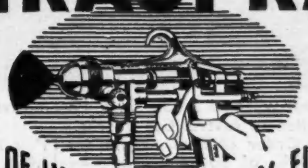

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179-213 THIMBLE MILL LANE, BIRMINGHAM, 7. Also at MANCHESTER, BELFAST, ETC.

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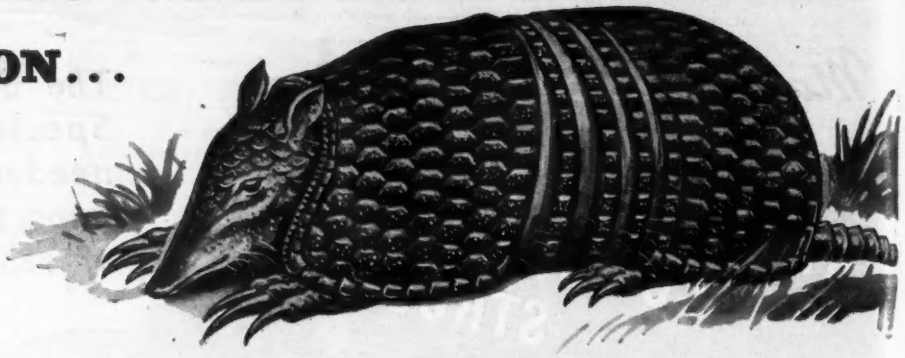


In common with the modern Gas Meter, the Armadillo may be said to consist of a delicate internal mechanism enclosed in an outer covering of protective plates. But whereas the Armadillo's outer covering is *his* protection, the inner workings of the gas meter constitute *your* protection and that of the consumer.

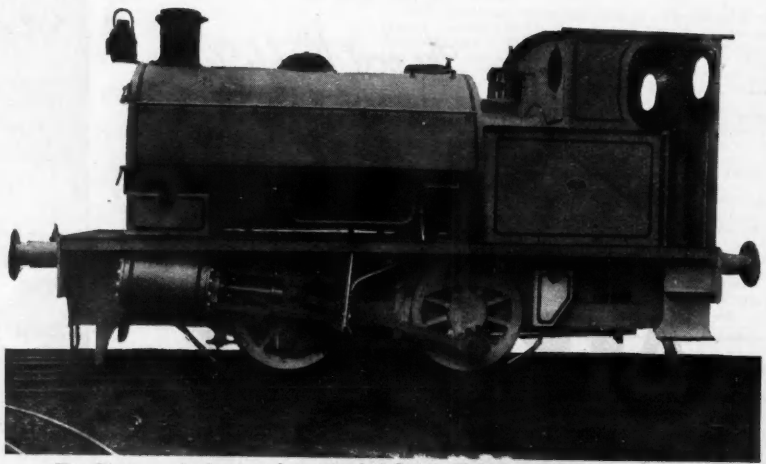
***your protection is the* A&M METER**

ALDER & MACKAY LTD., NEW GRANGE WORKS, EDINBURGH, 11.

GAS WORKS SHUNTING LOCOMOTIVES

BUILDERS OF ALL TYPES OF STEAM LOCOMOTIVES, ALSO WAGONS, TURN-TABLES AND OTHER RAILWAY EQUIPMENT.

LOCOMOTIVES DESIGNED TO SUIT CLIENTS RE-QUIREMENTS



The Photograph shows a four-wheeled Saddle Tank Locomotive, as recently supplied to several Gas Works.
Weight in Working Order 27 Tons. Cylinders 14" × 22"
Tractive Effort at 85% of Boiler Pressure — 13,800 lb.

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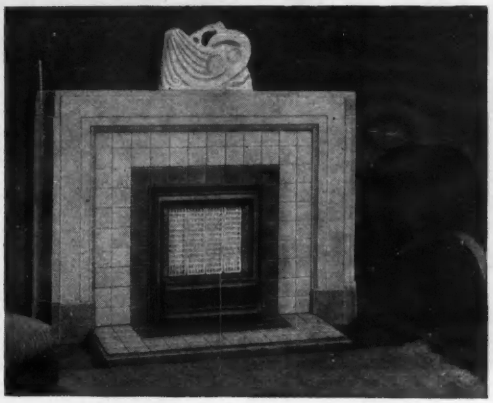
32, VICTORIA ST., S.W.1
Tel.: ABBEY 1882



PORTCULLIS "DARTMOUTH" GAS FIRE

Design of unusual merit associated with advanced technical efficiency will continue to be characteristic qualities of the products of Bratt Colbran when peace-time manufacture is resumed.

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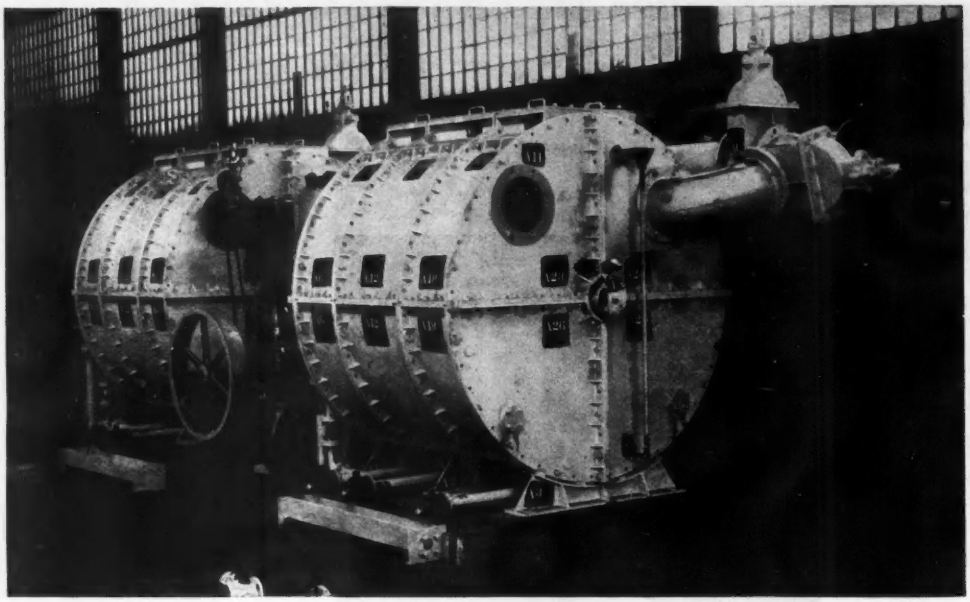
Ten, Mortimer Street, London, W. West One

MAKERS OF THE PORTCULLIS RANGE OF PRODUCTIONS



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FOR LONG PERIOD CONTINUOUS RUNNING

HIGH SPEED
TOTALLY ENCLOSED MECHANICAL LUBRICATION
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DUST EXCLUDING FITTINGS (if required)

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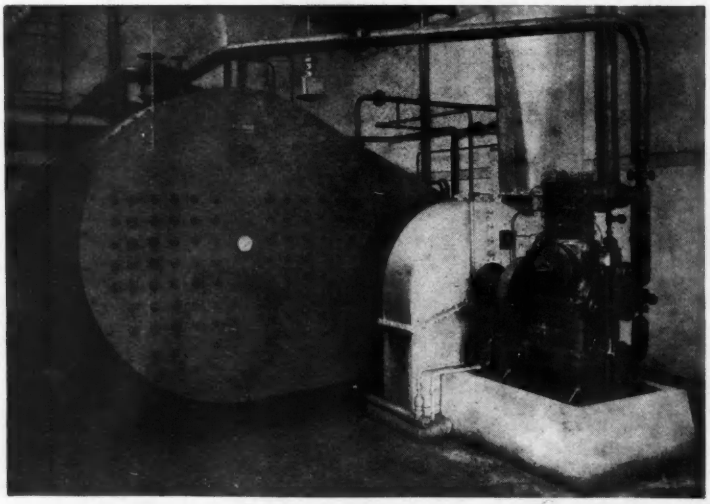
EXCEPTIONALLY LOW STEAM CONSUMPTION UNDER VARYING LOADS OBTAINED BY SISSON PATENT AUTOMATIC CRANK-SHAFT GOVERNOR



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The HUB of the modern kitchen—

A well-designed Gas Cooker which neatly lines up with modern kitchen equipment. It is fitted with "Autokook" oven heat controller, patent extending oven grid shelves, and is beautifully finished in vitreous enamel.

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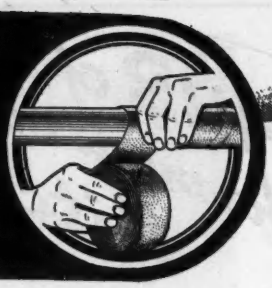

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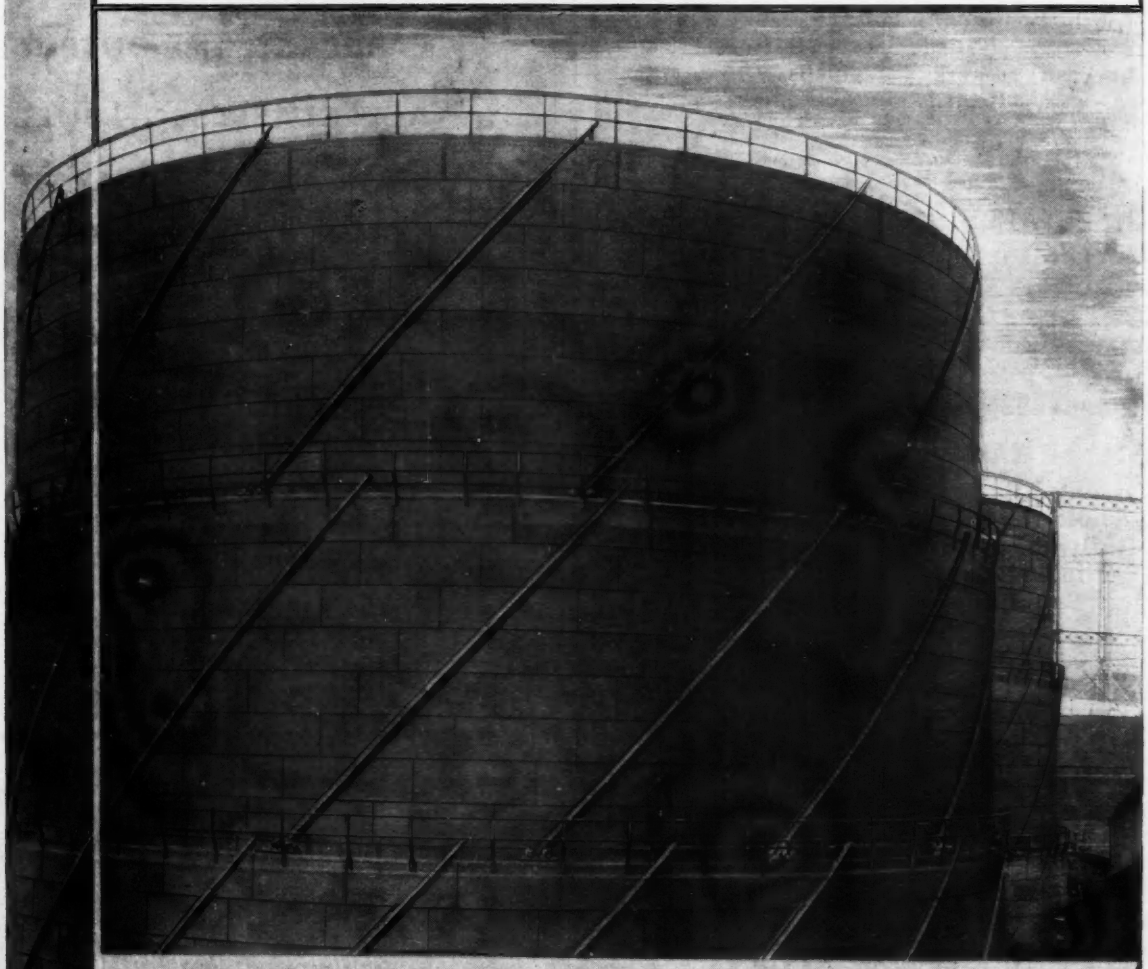

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Used by the leading Gas Companies for the protection of the lower plates and cuppings of gasholders. The most efficient anti-corrosion paint in existence

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OXY-GRAFITE PAINT

For the Protection against the corrosive effects of acid and alkaline fumes on all iron and steelwork of gasworks, Aspinalls Oxy-Grafite Paint is unsurpassable

Full particulars and prices on request from the sole proprietors

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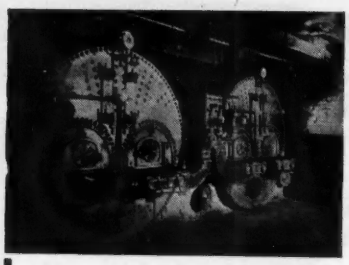

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Buildings of every Type for the Gas Industry

Horizontal Retorts
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We specialise in construction and welcome your inquiries at any time for any of the plant mentioned.

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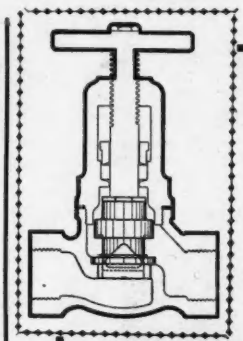

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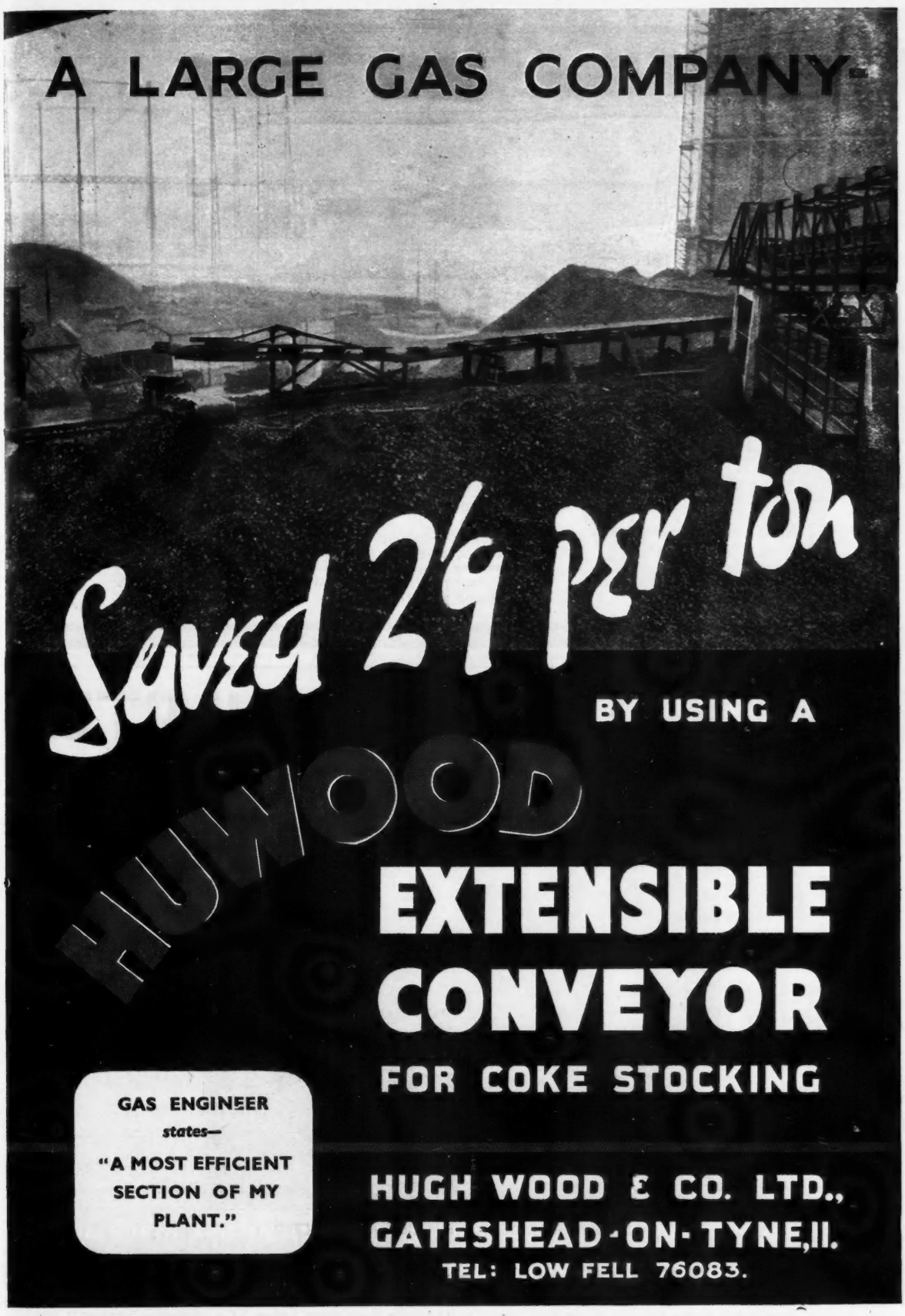
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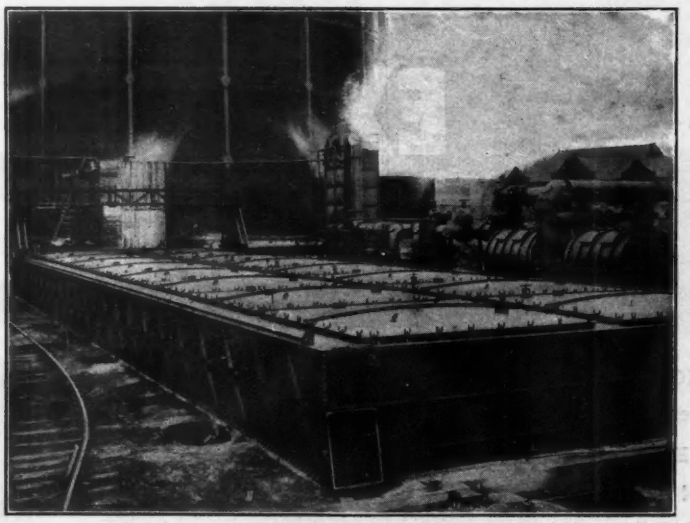

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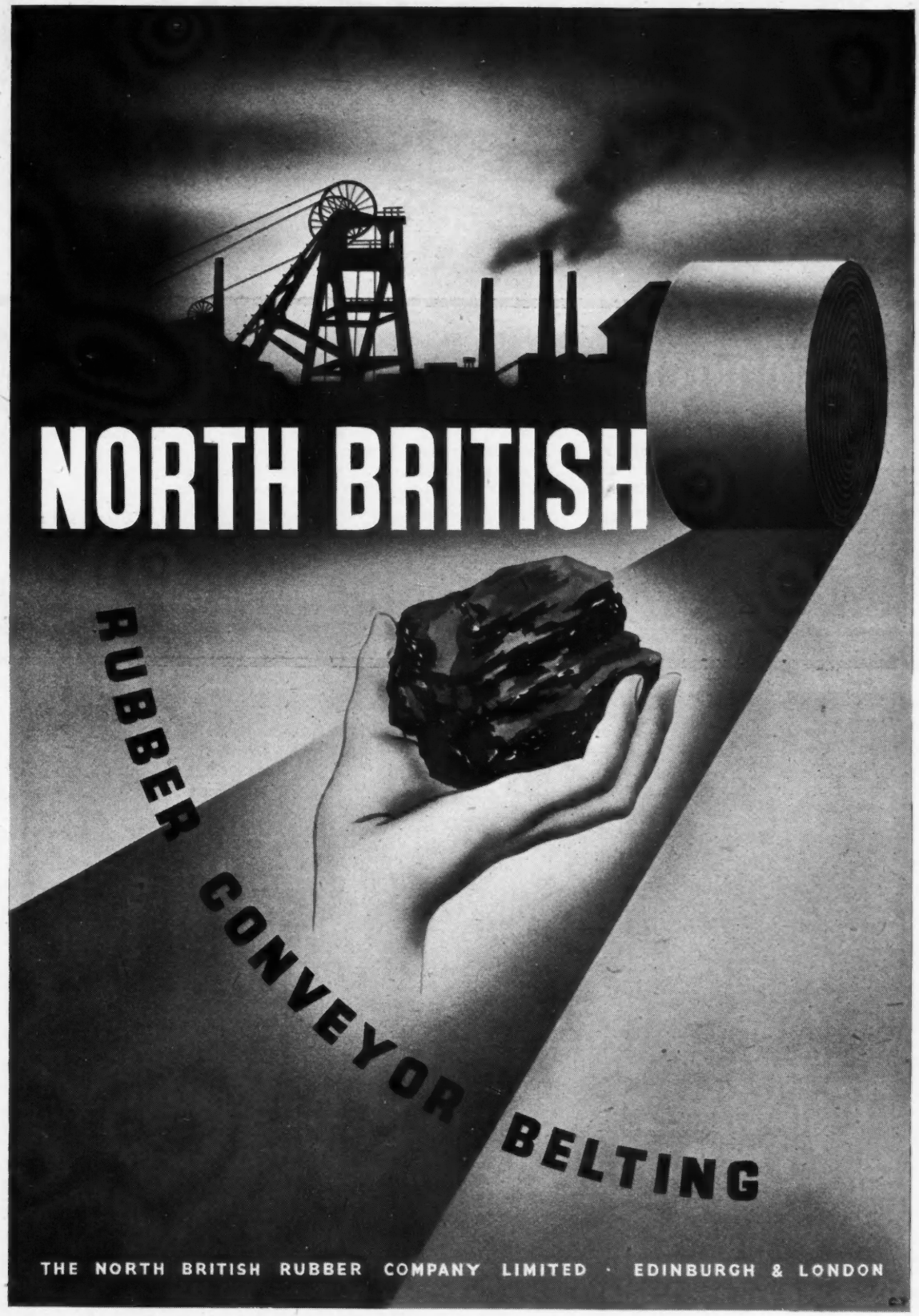
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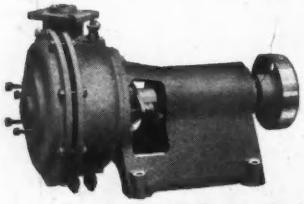

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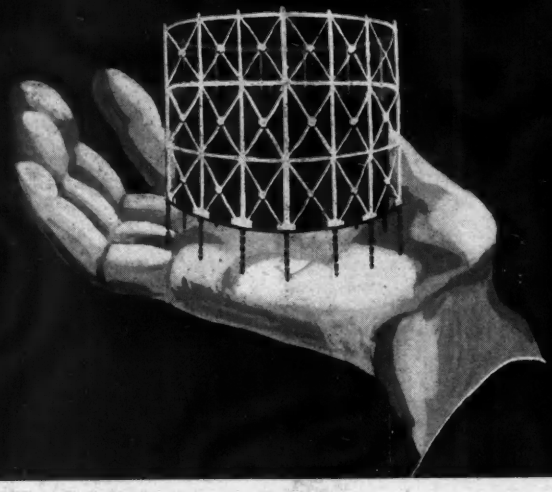

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